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THE UNIVERSITY OF ALBERTA

HAY RIVER, N. W. T.

by

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A THESIS

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ABSTRACT

The small sub-arctic community of Hay River is located in the southern part of the Northwest Territories. For some fifty years previous to 1948 it had been an isolated Indian settlement with missions and fur trading. Between 1948 and 1965 an entirely new town has grown up with the same name but with quite different functions. In the thesis some of the changes that took place are traced and examined; and a picture of Hay River today is presented.

In terms of its economic base it still remains today what it was in 1949, a fishing and transport centre. However, changes are taking place. With the completion of the Great Slave Lake Railway in 1964 the function of the town as a transport centre for the whole region is growing rapidly. It is also the communications centre for the Northwest Territories.

Of the towns in the Northwest Territories Hay River approximates most closely to towns in the area of continuous settlement in southern Canada. It has a relatively diversified economy, particularly in service and retail activity, and it has a definite service area which is used to some degree of intensity. Hay River serves to exemplify the impact of southern developments on northern communities.

The town does suffer, however, from a considerable site problem. Location in a delta is in itself a problem, and this has been emphasised by the creation of four separate nuclei of settlement over the last sixteen years. The serious flood of 1963 brought greater awareness of many of the problems of the community. In fact Hay River has since then become a partially planned community, and there is hope that soon there will be an overall plan for the whole community.

ACKNOWLEDGEMENTS

Most of the material and ideas expressed in the thesis stem from a period of three months' field research in Hay River. I would like to thank most sincerely the Directorate of the Boreal Institute who provided a research grant to make possible field work.

Without the cooperation and help of the people of Hay River many of the detailed statistics would have been impossible to obtain; to them also I extend my thanks. In particular a special note must be made of the help given by Mr. and Mrs. D. Gamble, Mr. E. Allen, Mr. F. E. White, Mr. T. MacCauliffe, Mr. D. Wotherspoon, Father F. Ebner, Rev. R. Hall, Mrs. R. Scott, Mrs. J. Mackie and Mr. J. Audibert.

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TABLE OF CONTENTS

	Page
ABSTRACT-----	iii
ACKNOWLEDGEMENTS -----	v
TABLE OF CONTENTS -----	vi
LIST OF FIGURES -----	ix
LIST OF TABLES -----	x
LIST OF PHOTOGRAPHS -----	xii
INTRODUCTION -----	xiv
CHAPTER	
I THE PHYSICAL SETTING -----	1
Major Physiography and Geology -----	1
Landforms -----	3
Soils and Vegetation -----	6
Climate -----	8
Permafrost -----	11
II DEVELOPMENT OF HAY RIVER-----	14
Part 1 - Early Growth 1840-1940 -----	14
Part 2 - Development of Modern Hay River 1940-1960 -----	22
(a) Post War Developments and coming of Mackenzie Highway ---	23
(b) Growth 1949-1960 -----	26

Chapter		Page
III	THE NATURE OF THE COMMUNITY, 1960-1965-----	33
	Population -----	33
	Labour Force -----	37
	Indians -----	41
	Land Use -----	45
	Housing and Building -----	46
	Social Conditions -----	49
	Flooding Problem-----	51
	Conclusion-----	55
IV	ECONOMIC STRUCTURE-----	56
	Employment Structure and Changes-----	57
	Population Supported by Various Activities -----	61
	Enterprises Supported by Sectors-----	63
	Taxation Base-----	65
	Basic - Nonbasic Method-----	68
	Comparisons-----	71
	(a) Employment-----	71
	(b) Sales Conversion-----	72
	(c) Minimum Requirements-----	75
	(d) Floor Space-----	75
	Summary-----	78
V	FISHING AND TRANSPORTATION	81
	Fishing Industry-----	81
	(a) Commercial Fishery-----	83

Chapter		Page
	(b) Future Prospects-----	92
	Transport and Communication -----	97
	(a) Air Transport-----	97
	(b) Water Transport -----	99
	(c) Road and Winter Road Transport-----	104
	(d) Rail Transport-----	109
VI	HAY RIVER: ITS ROLE IN THE NORTHWEST TERRITORIES-----	114
	Primary Area of Influence-----	115
	Secondary Area of Influence -----	118
VII	PROBLEMS AND PLANNING IN HAY RIVER-----	122
	Location on Vale Island and Associated Problems-----	122
	Planned Hay River-----	125
VIII	CONCLUSIONS-----	133
	BIBLIOGRAPHY-----	141
	APPENDICES-----	154
I	Climatic Data, Hay River, Fort Simpson, Fort Smith, Fort Resolution and Fort Vermillion-----	155
II	Length of Navigation Season -----	156
III	Floor Space and Valuation Hay River 1964 -----	157
IV	Agriculture-----	158
V	Business Survey Questionnaire -----	159

LIST OF FIGURES

Figure		Following Page
1	Northwest Canada Centres of Activity-----	1
2	Physical Features Hay River Area-----	4
3	Soil Types - Hay River Delta-----	6
4	Hay River, 1922 -----	17
5	Hay River, 1965 -----	32
6	Population of Hay River Selected Years-----	34
7	Population Pyramids Hay River 1951-1965-----	35
8	Population Pyramids, Hay River, Yellowknife, Fort Smith, Northwest Territories 1961-----	36
9	Percentage Distribution by Age of White Population, Hay River, N. W. T., Canada-----	36
10	Land Use Hay River, 1965-----	45
11	Great Slave Lake-----	82
12	Surface Transport Routes Mackenzie Valley -----	105
13	Scheduled Northbound Air Routes and Communications-----	111
14	Service Areas	115
15	New Subdivision Hay River, 1965-----	125

LIST OF TABLES

Table		Page
I	Population Growth Hay River 1961-1965-----	34
II	Growth Rates 1951-1961-----	35
III	Wages p.a. of Wage Earners, Hay River 1965----	39
IV	Years Worked at Present Employment, Hay River 1965-----	41
V	Total Indian Income, Hay River 1963 -----	45
VI	Housing by Area and Type, Hay River 1965 -----	47
VII	Housing by Type, Hay River 1965-----	48
VIII	Comparative Standards of Housing, 1961 -----	49
IX	Continuous Occupancy by Head of Household, Canada, Hay River, Fort Smith 1961-----	50
X	Employment by Industrial Divisions, Hay River 1961-1965-----	58
XI	Population Supported by Types of Economic Activity, Hay River 1965-----	62
XII	Breakdown of Gross Income to Enterprises, Hay River 1965-----	64
XIII	Annual Revenue, Hay River 1957-1964-----	66
XIV	Local Revenue by Source, Hay River 1964-----	67
XV	Basic Employment, Hay River 1965-----	69
XVI	Employment Comparisons, Minnesota, Hay River, Fort Smith, Yellowknife-----	73
XVII	Comparison of Basic Activity, Hay River, Fort Smith and Yellowknife 1961-----	74
XVIII	Comparison of Floor Space Ratios, 1964 -----	77

Table		Page
XIX	Index of Support to Community by Industry, Hay River 1965-----	79
XX	Landed Fish Great Slave Lake 1945-1964 -----	86
XXI	Average Price at Chicago 1962-1964-----	87
XXII	Fishing Industry Payroll 1953-1964-----	87
XXIII	Resident and Non-Resident Licences, Hay River, Selected Years-----	89
XXIV	Percentage of Inland Fishing, Northwest Territories, Ontario and Alberta 1962 -----	91
XXV	Inland Fisheries Efficiency 1962-----	91
XXVI	Percentage Lake Trout and Whitefish Receipts at Chicago 1953-1964-----	93
XXVII	Percentage Freshwater Fish Receipts at Chicago by Province and State 1963-1964 -----	94
XXVIII	Generalized Freight Rates, Great Slave Lake Area per 100 lbs. 1965-----	98
XXIX	Air Transport Statistics, Scheduled, Hay River 1963-1965-----	99
XXX	Waterborne Freight on Slave River, Great Slave Lake and Mackenzie River 1958-1965-----	102
XXXI	Percentage Total Waterborne Freight Handled by Fort Smith and Hay River 1957-1965-----	102
XXXII	Southbound Waterborne Freight to Hay River 1965-----	103
XXXIII	Total Bulk Fuel Delivered to Yellowknife 1960-1965-----	103
XXXIV	Bus Transport Statistics 1963-1964-----	109

LIST OF PLATES

Plate		Following Page
1	Airview escarpment of Alberta Plateau-----	2
2	The Hay River at Alexandra Falls-----	2
3	Permafrost necessitates piling-----	11
4	Building affected by permafrost-----	11
5	Air View Hay River 1933-----	16
6	Air View Indian Village 1965-----	16
7	Air View Hay River 1953-----	27
8	Air View West Channel-----	27
9	Air View Hay River 1965-----	32
10	Air View down Main Channel of Hay River 1965-----	32
11	Mackenzie Drive, focus of commercial activity-----	45
12	Mackenzie Drive looking south-----	45
13	Typical Housing along Mackenzie Drive-----	48
14	Part of the West Channel Fishing Village-----	48
15	A two or three-man fishing boat-----	83
16	A packer boat towing a barge-----	83
17	Two of the major fish company plants-----	96
18	The Hay River airport after rain-----	96
19	The Hay River dockyard-----	99

Plate		Page
20	The Hay River Waterfront-----	99
21	A tug pushing two barges-----	100
22	A tug with a background of ice on Great Slave Lake-----	100
23	A corner of the Hay River dockyard in winter-----	109
24	The Hay River marshalling yard-----	109
25	Air View of the new subdivision -----	128
26	Part of the new subdivision-----	128
27	A street in the new subdivision-----	130

INTRODUCTION

Hay River is a small, sub-arctic community of approximately 2,000 people, located on the southern shore of Great Slave Lake, at the mouth of the Hay River. Yet in terms of the Northwest Territories as a whole, with a population of only 25,000, and containing only four towns with a population greater than 1,000, the significance of Hay River is greater than might be expected from size alone. Such towns in the North represent the greater part of the investment, building, services and capital in the area. They are frequently the focus of development, contribute much of the income received by the Territories and are the main areas where new and southern influences, such as planning, investment and industrial activity are felt. It is in the towns that the greatest amount of contact between the native populations and the new immigrant, predominantly white, population occurs. Thus it is in the towns, that problems of integration and social development will first be met as the North grows and becomes less isolated from the area of continuous settlement in Southern Canada.

This thesis focusses upon one of the larger and more rapidly expanding communities in the Northwest Territories, and is an attempt to examine the town in all its aspects: to see why it is there at all; to analyse its economic structure and see how this has developed; and to consider what is the role of the town within the Mackenzie District and the Great Slave Lake region.

The Town is interesting from several points of view. It has developed from a typical Mackenzie Valley settlement, based on trapping and hunting, the export of fure and on missionary activity to a modern sub-arctic community with a more stable economic base. It has not been a boom town in the sense that mining towns, notably Yellowknife, have been. Many of the developments and changes affecting the North West in general have been reflected in Hay River. The wartime Canol project in 1942 saw for a brief period a rise in the tempo of activity in the town. The post war mining boom affected the town insofar as a new townsite grew up in the delta partially based on supplying Yellowknife. Improvements in transport and communication in the Northwest Territories during the last fifteen years have usually affected Hay River to some degree. Thus the town of Hay River has been increasingly affected by southern influences penetrating into the Northwest Territories.

As access by road and other communications improve, many more settlements will, in the near or distant future experience something of the changes that have affected Hay River over the last twenty years. It appears likely that the magnitude of change will, however, be much less. At present several of these settlements are largely native and still retain much of the traditional nature and economy. Lack of easy communication is one factor which maintains this; thus the provision of roads may have significant effects on the younger generations of natives.

Hay River has considerable site problems which, in part, are a result of the rapid, largely unplanned, development which occurred when the Mackenzie Highway was completed from Grimshaw

to the Great Slave Lake in 1948. The Indian settlement of Hay River had been located on the east bank of the river, a relatively dry and well-drained site. The new townsite was laid out on a low-lying island in the delta, and the next year, 1949, a fishing village was established on the West side of the island. In general this area is poorly drained with a good deal of muskeg, has soft surficial material and is underlain by discontinuous permafrost. Each spring, river melt-water is dammed by lake ice and some flooding occurs; thus in 1964 a move was made to the mainland south of the island and four distinct centres now exist. Several settlements in the Mackenzie Valley have similar site problems. Both Inuvik and Aklavik are located in a delta and Fort Simpson, located on an island at a river confluence, has a spring flood problem.

The study of the town is presented in an historical context. The historical section attempts to trace the development of settlements on the Hay River site from the mid-nineteenth century to 1960, and examines reasons for location there and some early problems.

The present settlement is looked at in considerable detail using the period 1960-1965 in order to give a better general picture and to make maximum use of available statistics. In this section attempts are made to indicate Hay River's position in relation to certain features of the Northwest Territories which are commonly thought to be characteristic of settlement in the North. The town also, in certain cases is compared to overall Canadian figures. Some of the current problems are outlined in this section.

The section on the town's economic structure is intended to

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be a survey of economic activity within the town. Several methods of urban analysis which have been used in more normal situations are used, including a survey and analysis of industrial floor space, which enables a limited measure of comparison to be made with similar sized towns in Alberta. The basic - nonbasic approach is applied, incorporating both the minimum requirements and the sales conversion (by labour force and payroll) methods. This approach enables the distinction between town-forming and town-serving activity to be made and measured, and gives some idea of what activities are actually responsible for the present growth and development of Hay River. Throughout this section certain characteristic features of northern living and of northern settlements have become manifest, and have imposed limitations on the analyses presented. The first factor is the practice of "moonlighting" and the prevalence of supplementary income. The second is the mobility and flexibility of both labour and business, so that in Hay River people are frequently fishermen one year and construction workers the next and the number of businesses which shut down and spring up is high. Also there is a lack of large, developed urban centres in the North generally so that small towns in fact perform functions and provide services which would not normally be expected of them. One major problem is the measurement of government support in northern towns, particularly in view of the fact that most are heavily dependent on government finance in one way or another. Thus direct government grants are received in Hay River which have recently exceeded income from taxation. These contribute to the construction of public buildings, the provision and maintenance of

roads and sidewalks, flood compensation payments and, recently, the provision of a piped water and sewage system for the new townsite.

One of the greatest problems in the study of northern settlements is the lack of comparative data. Employment data for towns of less than 10,000 persons are not published in Canada, and there are few detailed studies available of small towns. Thus comparisons have been made by three methods. The calculation of floor space allowed some comparison with small Albertan towns. The use of the minimum requirements enabled comparison to be made in terms of non-basic activity. By regression analysis the lowest amount of non-basic employment is found for each industrial group, in a viable Canadian town of 1,999 persons. Thirdly comparison is made with small towns (between 2,500 and 10,000 persons) in Minnesota, where average employment figures were available. This enables some comments to be made on how "northern" is Hay River; and consideration of how northern communities differ from those located in areas of continuous settlement.

In order to assess Hay River's role in the Northwest Territories it is necessary to consider whether the town has an area of influence and if so to what extent this is developed. Because of the lack of urban centres and the non-existence of a rural population in the North, such an area is not a trade area or service region, but is a homogeneous unit in terms of service activity, transport and communication. Patterns do emerge, however, and it is against such patterns that the possible impact of future changes in transport or economic development may be assessed.

As noted previously Hay River has a considerable site problem, and to overcome many of the difficulties arising from this a new planned subdivision has been located on the mainland about two miles south of the 1948 Vale Island townsite. This involves problems of planning in a harsh physical environment which many authorities feel calls for special planning principles and controls, rather than an extension of southern planning designed for areas less extreme climatically. Moreover, good planning should emphasize town functions; thus consideration is given to how well present planning fits in with the dominant economic activity within Hay River, and with the town's regional functions.

A feature which causes considerable problems and may impose certain limitations on conclusions is the transitional state of the town in 1965. The severe flooding of spring 1963 caused considerable dislocation in the town; buildings were damaged and in some cases moved. The hurried measures of the summer of 1963 enabled the development of a new residential area, which by 1965 was only half occupied. Many people remained on Vale Island and businessmen expressed a reluctance to commit themselves to a move away from what appears to be the centre of the community. The Great Slave Lake Railway, terminating in Hay River was completed in December 1964 but will not be fully operational until 1967. Thus assessing the effects of this is difficult. The amalgamation of the two waterborne transport companies operating in the Northwest Territories took place early in 1965; thus the 1965 season was the first of the new operation and entailed some

reshuffling and reorganisation. Both of these factors contributed to the transitional nature of the community in 1965.

In the view of many residents the town is hampered by government control. The necessity to seek approval for many proposed measures and plans may result in delays which frequently seem particularly irksome to northern residents. who would like to see more direct action. Thus whilst most residents are optimistic, they retain a certain degree of uncertainty.

The information and data on which the thesis is based were gained largely during a period of three months' field research undertaken in the summer of 1965. The method of approach was that of personal interview and observation. A business survey was conducted by questionnaire, administered during personal interviews. Fifty-five of the sixty enterprises active in the town at that time provided valuable information. The small size of the town enabled numerous cross-checks, and it was also possible to estimate fairly accurately where answers were unobtainable.

CHAPTER I

THE PHYSICAL SETTING

Hay River is located in the Canadian northwestern sub-arctic. In terms of physical surroundings the town is typical of most of the settlements of the Mackenzie District, the central part of the Canadian Northwest; much more typical, in fact, than Yellowknife, the biggest town. Despite southerly location in the District, Hay River shares the disadvantages of the environment with the other settlements. In a detailed analysis of site and situation, it is these disadvantages, varying in degree, which become important and become translated into the economics of time and money.¹ Later in the study it is hoped to show some of these in more detail, and consider their effects; the intention here, however, is to place Hay River in its general surroundings.

Major Physiography and Geology

Hay River lies within the Mackenzie drainage basin, an area which includes segments of three major physiographic regions; the Canadian Shield on the east, the Cordillera on the west and the Great Plains division, forming the major part, in the centre. The Great Plains division, a northward continuation of the Central Plain of North

¹For a discussion of this see F. G. Ridge, General Principles for the Planning of Subarctic Settlements, unpublished Ph. D. Thesis, Dept. of Geography, McGill University, 1953, 568 pp.

NORTHWEST CANADA CENTRES OF ACTIVITY

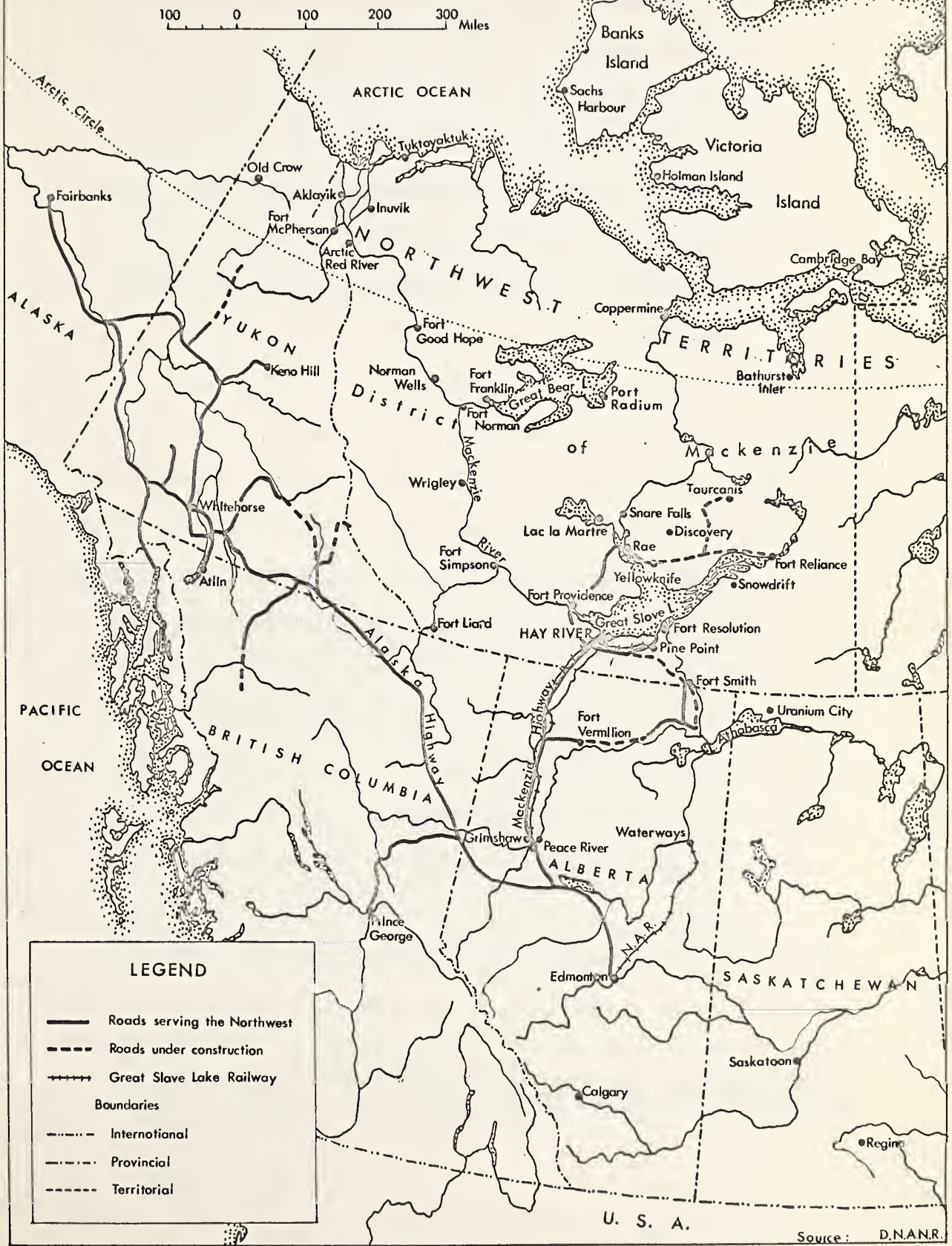


Figure 1

America, consists of gently tilted Paleozoic sediments resting on a Precambrian basement, and forms a rolling lowland sloping northwards at two feet per mile.² The larger, erosional depressions form lakes, the western part of Great Slave Lake being a good example.

This plain, 1,300 miles long and 400 miles wide at Fort Providence, has two physiographic subdivisions. In the southern part is the Alberta Plateau of Cretaceous rock. It is tilted toward the northeast, and bounded on the north by an abrupt escarpment, 150 feet high, roughly parallel to the Shore of Great Slave Lake, which marks the unconformity of the Devonian with the Cretaceous in this area. Although in the main a structural feature, the escarpment has been modified by subsequent river erosion, creating waterfalls; thus, on the Hay River at Alexandra and Louise Falls, the scarp has two steps and is actually being eroded in Devonian rock. This forms one of the major landscape features of the area. Two hill masses, also of Cretaceous rock, stand out from the plateau, the Caribou Hills on the east, and the Cameron Hills on the west, rising to 3,500 and 2,200 feet above the general 950-foot level of the plateau. Between these two masses flows the Hay River in a broad trough. North of the escarpment is the Mackenzie lowland proper, a northward sloping plain of Devonian rock.³

Hay River is situated some thirty miles north of the escarpment, in the Mackenzie Lowland and on the southern shore of Great

²C. Camsell and W. Malcolm, The Mackenzie River Basin, Geological Survey Memoir 108, Dept. of Mines and Technical Surveys, Ottawa, 1919, 150 pp.

³Ibid., p. 23.



1. Airview looking east along the escarpment of the Alberta Plateau. To the north is the lacustrine plain, and on top of the plateau is the morainic area. Most features are obscured by vegetation.



2. The Hay River at Alexandra Falls, looking south. In the background is the Mackenzie Highway and Great Slave Lake Railway.

Slave Lake, at an elevation of 525 feet above sea level. Southward the land rises steadily to 750 feet at the foot of the escarpment.

The southwestern shore of Great Slave Lake is in Devonian sediments, a deposit some 1,600 feet thick of shale, limestone and dolomite.⁴ The rocks are domed in a gentle anticline which has its axis, in a northwest to southeast trend, through Presqu'ile Point and Lonely Bay, with Big Island and Gypsum Point on the west and east limbs. Erosion has removed the top and exposed Presqu'ile dolomite in the centre. This formation and oil seepages led to considerable oil exploration activity between 1929 and 1939, and again in 1949. Results were disappointing, and exploration has since passed by. Mineralization of Pine Point limestone and Presqu'ile dolomite filled the pore spaces with lead-zinc ores, and these form the basis of mining at Pine Point and the reason for the location of the new settlement there.

The relatively soft and poorly consolidated nature of the shale and limestone bedrock allowed the formation of considerable amounts of till during the glacial period.

Landforms

The present landscape around Hay River owes little to bedrock geology and is largely a result of glaciation, river development and the shrinking of Great Slave Lake. Nearly everywhere bedrock is concealed by surficial deposits.

⁴J. D. Bateman, "Petroleum possibilities in the Great Slave Lake area," Western Miner, Vol. 20, No. 11, Nov. 1947, pp. 72-76.

During the Wisconsin glaciation Keewatin ice advanced in a southwest direction, moving first in a lobe up the Hay River trough, which is probably a pre-glacial valley,⁵ and then covering the entire area. Glacial till is characteristic of the escarpment top area, south to about Mile Fifty on the Mackenzie Highway.⁶ It is described as "a very calcareous clay till containing numerous small stones but in many places this till is covered by a sandy till with numerous large boulders."⁷ The surface is "gently rolling to rolling."⁸

North of the escarpment there is little morainic material; surficial deposits are largely lacustrine and a result of the shrinking of Great Slave Lake, which during deglaciation, was a glacially dammed lake. The highest beach level detected by Leahey was 870 feet,⁹ at Mile Twenty Eight on the Highway, just below the escarpment. This seems to correspond with the lake's occupance of the Slave River Lowland, (Figure 2), since filled in, and may be the same as Cameron's 800-foot lake level.¹⁰

⁵R. G. McCrossan and R. P. Glaister. Geological History of Western Canada, Alberta Society of Petroleum Geologists, Calgary, 1964, 232 pp.

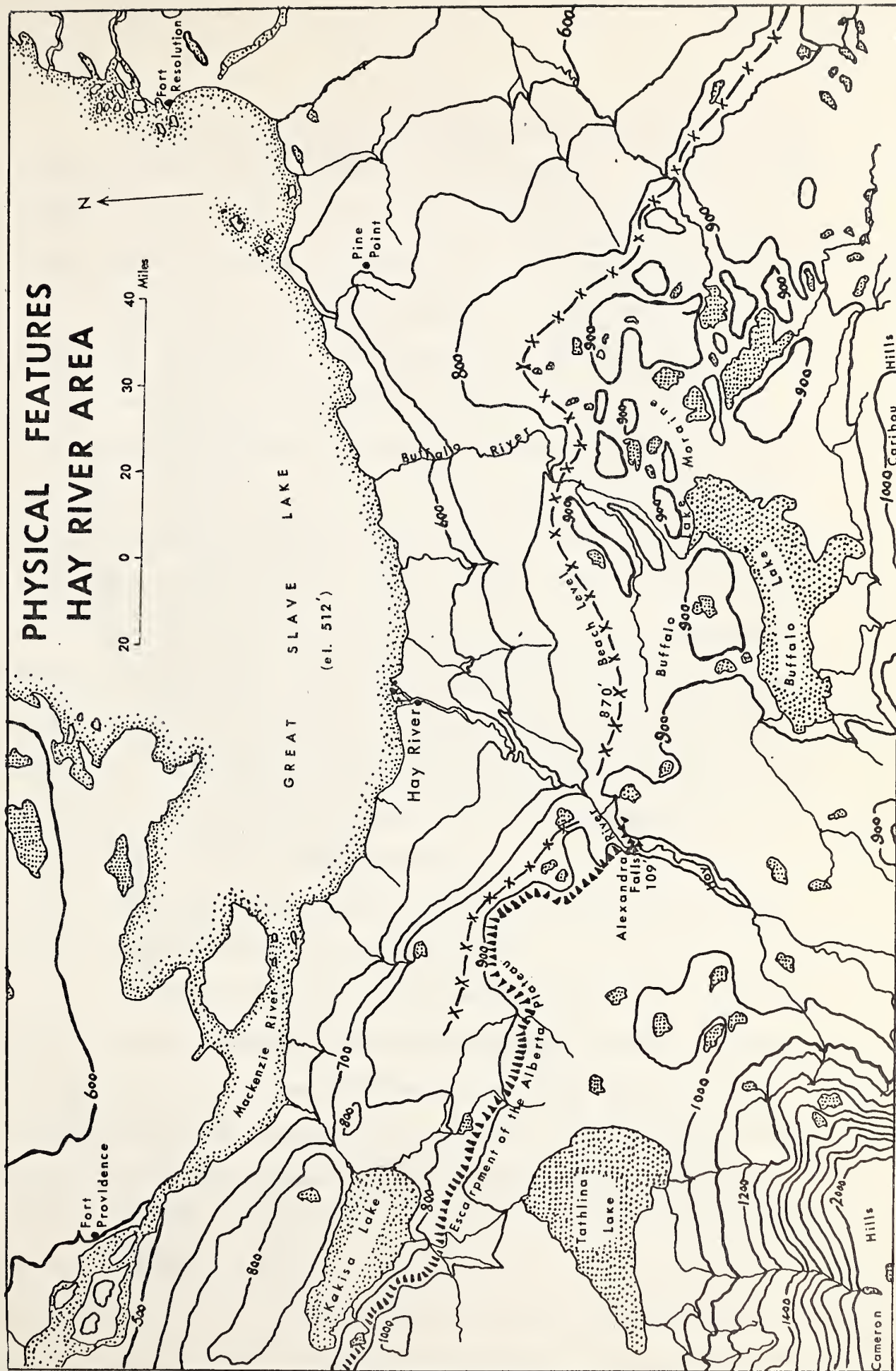
⁶The road distance from Hay River to the Alberta border is 80.6 miles. Mile 0 is the town itself.

⁷A. Leahey, Preliminary Soil Survey of Lands Adjacent to the Mackenzie Highway in the Northwest Territories, Experimental Farms Service, Canada Dept. of Agriculture, Ottawa, 1953, p. 5.

⁸Loc. cit.

⁹Ibid., p. 4.

¹⁰A. E. Cameron, "Post-glacial lakes in the Mackenzie River Basin," Journ. of Geol., vol. 30, 1922, pp. 337-353.



Source: Topographic sheets 85 A,B,C,F,G,H, 1959

Figure 2

Beach ridges have been developed between the 870-foot level and the present shoreline at 512 feet; their number, a hundred beaches in 250 feet of elevation, indicates the rapidity of shrinkage. They form noticeable long low ridges alternating with swampy depressions.

There is a considerable difference in local relief north and south of the escarpment. To the south in the morainic area relief is greater and there is a preponderance of large lakes and sloughs. Cameron distinguished two recessional moraines running across the Hay River Valley; at the crest of the escarpment, to the east of the highway at Mile Twenty Nine, lies the major morainic belt of two hundred to three hundred feet in relief.¹¹ This ponds back the drainage from the northern slopes of the Caribou Hills to form Buffalo Lake. On the lake shore plain north of the escarpment there is little local relief, except beach ridges, to break the steady slope of the plain. This area is characterized by the absence of lakes and sloughs and the existence of much swampy muskeg, particularly along the lake shore where recent beaches impeded drainage.

This flat, swampy shoreline offers little in the way of harbours except the mouths of the major rivers.

The Hay River, rising three hundred miles to the southwest, flows across the northeastward sloping plateau in a broad, open valley. The Alexandra and Louise Falls have been formed where the river tumbles over the two steps of the escarpment, and have receded five miles from the general line of the escarpment. In the lake shore

¹¹Ibid., p. 345.

plain the river flows first in a small but steep-walled canyon, approximately one hundred feet deep, which gradually diminishes until at Mile Eight the river again flows in a broad, open valley.

At its mouth on the lake, the site of the settlement, the river forms a small delta, branching into two main channels and creating several islands, the largest of which is Vale Island, some ten square miles in area. The whole area is composed of alluvial material, much of it still subject to flooding, and there is much evidence of abandoned channels and former stream courses in the area. Depths of alluvial material vary from fifteen feet on the mainland, to sixty feet on Vale Island, whilst total regolith thickness over bedrock is between two hundred feet and sixty feet.

As a result of its site, the town of Hay River faces two major problems, annual flooding and poorly consolidated material for building foundations. Drainage conditions are also poor, particularly in the delta area. To the north of the escarpment the Hay River does not receive a major tributary.

Soils and Vegetation

Soil development in the area is poor and neither mineral nor organic soils are particularly well developed.

Mineral soils have developed on both glacial and alluvial parent materials. They range from the very recent alluvial soils, which show almost no profile development and are a silty clay loam, to calcareous grey wooded soils or till, with thin but well developed

SOIL TYPES - HAY RIVER DELTA

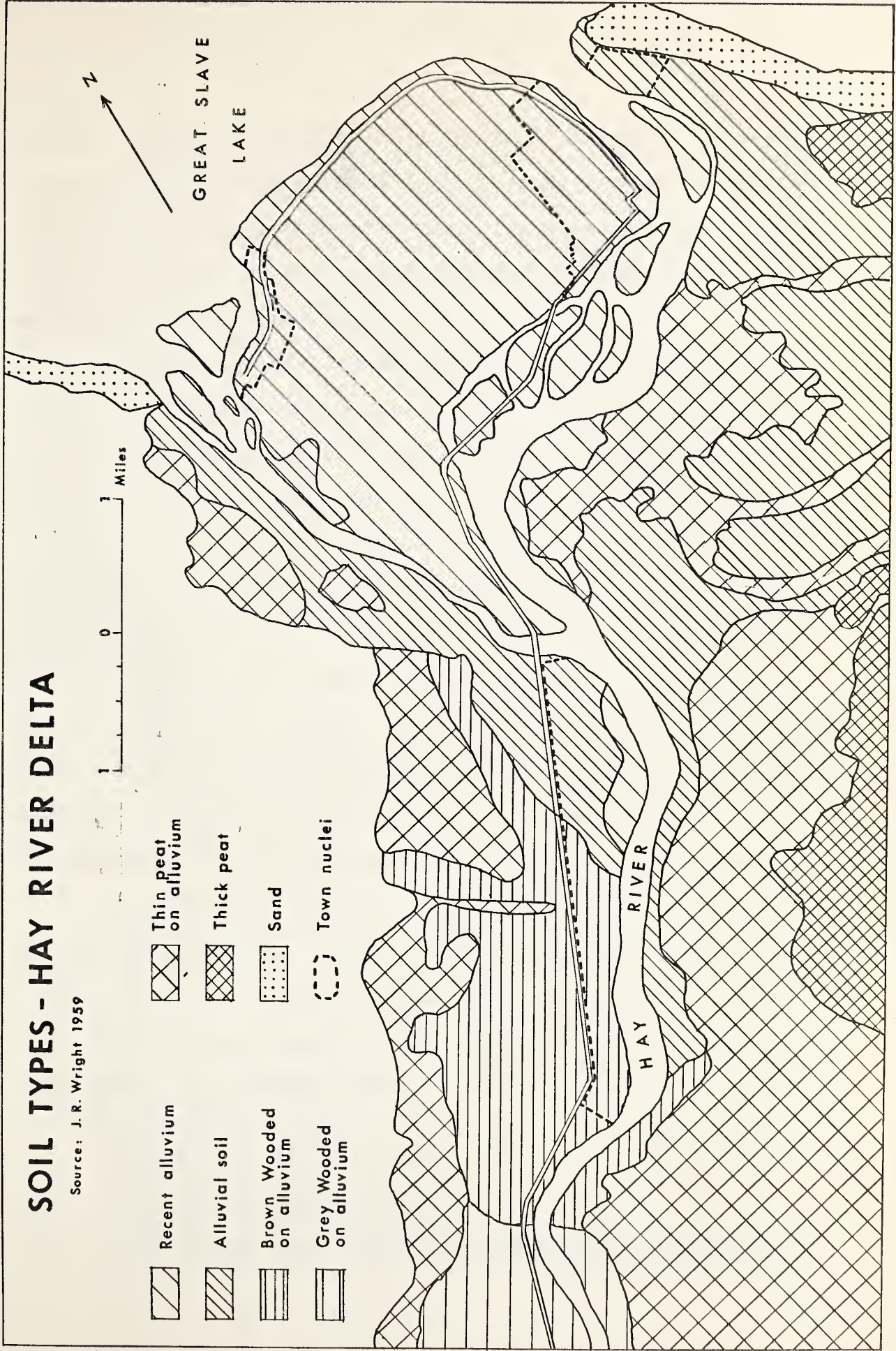
Source: J. R. Wright 1959



- | | | | |
|--|--------------------------|--|-----------------------|
| | Recent alluvium | | Thin peat on alluvium |
| | Alluvial soil | | Thick peat |
| | Brown Wooded on alluvium | | Sand |
| | Grey Wooded on alluvium | | Town nuclei |

GREAT SLAVE
LAKE

HAY
RIVER



profiles, frequently fine textured and friable.¹² Organic soil, or the formation of peat, is widespread; it occurs in all areas and is generally thin (Figure 3). It is found mainly in the depressions of the morainic area of the plateau, the ill-drained areas of the lake shore plain and in depressions between beach ridges.

Forming part of the Boreal Forest, the area is well covered with vegetation though trees tend to be small and sparse, especially in bog areas; muskeg, however, is well developed. Distributions are controlled largely by site conditions and nature of the soil. Jackpine is common and found mainly on sandy till soils, the sandy tops of beach ridges, and the better drained gravel soils, hence particularly on the morainic area on top of the escarpment. Aspen poplar dominates on clay till areas. Black spruce and tamarack are dominant in the area north of the escarpment, particularly in wetter, poorly drained sites, with willow common along the lake shore. Between the escarpment and the lake there is generally more open space and Leahey considers peat bogs to be expanding into areas not so poorly drained.¹³

Good stands of timber are found only infrequently and generally away from the lake. Although sawmills have operated here, there is really only timber for limited local needs. Better stands are found in the Pine Point area and in the sandy soils of the Slave River valley where there are good stands of pine.¹⁴

¹²A. Leahey, op. cit., p. 5.

¹³A. Leahey, op. cit., p. 4.

¹⁴J. H. Day, and A. Leahey, Reconnaissance Soil Survey of

Climate

In brief the climate of the area and the lake region in general is severe continental, or Dfc in the Koppen classification. Temperature averages -12.2°F in January and 59.8°F in July, though in recent years Hay River has had averages of -13.7°F and 61.8°F for these two months.¹⁵ Precipitation is usually slight. The annual average for Hay River is 12.59 inches, although between 1961 and 1964 it has averaged 17.9 inches. Average snowfall is about 15 inches per month through the winter between November and March. Depth of snow on the ground during this time is usually 25 to 30 inches. Basically the climate has long, cold winters and brief, cool summers. This part of northern Canada, however, is not as cold as the equivalent latitudes in the East, where Arctic climates obtain.

Great Slave Lake in summer has a considerable moderating effect on the climate. Temperatures are usually lower in Hay River than at Fort Smith, and the frost free period is longer along the lake shore than further inland. (See Appendix I)

Local weather is largely produced by the succession of cyclones moving southeastwards across the area. In the summer these can give either cool, damp weather with prolonged rain, or severe storms which make the lake dangerous and fishing impracticable.¹⁶ Also

the Slave River Lowlands, in N. W. T., Experimental Farms Service, Canada, Dept. of Agriculture, Ottawa, 1957, p. 6.

¹⁵ Hay River meteorological station, data for 1961 - 1965.

¹⁶ W. A. Kennedy, "The First Ten Years of Commercial Fishing on Great Slave Lake," Bull. Fish. Res. Ad. Canada, vol. 107, 1956, indicates eight storms per season prevent fishing.

movement and construction work in the area can be made difficult with the creation of severe mud conditions in and around settlements. Wind is also an important local factor. In summer a wind from the lake means cooler, fresh weather, whilst southerly winds bring hot, dry, weather. In winter, cold northerly winds sweeping across the frozen lake lower temperatures and raise the windchill factor. In general, however, the winter is less extreme in Hay River than in Yellowknife.

The table in Appendix I shows many of the climatic factors controlling plant growth, from which Hay River does seem less favourable than Fort Simpson or Fort Vermillion. Thus, despite a fairly long frost free period (eighty-seven days as against sixty-five at Fort Vermillion), the colder climate reduces the day degrees above 42°F to 1466.¹⁷ Moreover lack of water in the Hay River area can in many years prove a severe handicap. There are, however, indications that conditions might be better away from the lake where temperatures are higher and rainfall greater.¹⁸

As throughout the North, the importance of climate in terms of settlement development is in the greater cost of winter heating and the more expensive building methods and materials necessary to combat the cold. Hay River has 14,518 fuel consumption day degrees, just 600 lower than Yellowknife, and 4,700 greater than Edmonton.¹⁹ As

¹⁷ See Appendix I.

¹⁸ A. Leahey, op. cit., p. 21.

¹⁹ Heating is considered necessary below 65°F. Fuel consumption day degrees are the number of days below 65°F multiplied by the

Bourne points out, increase in heating costs may be as much as 50 per cent above those in Edmonton.

An important climatic side effect is the seasonal ice cycle. It affects Hay River in the duration of the navigation season and the flooding problem.

Hay River's average navigation season is just less than four months; break up is relatively late, June 10th (see Appendix II), although the Slave delta and the Mackenzie at Providence are open a month earlier. Also a northeasterly wind will pack drift ice into the western part of the lake as late as the second week in June hence this is usually the earliest that barge loads can be sent down the Mackenzie.

Since the ice of the northward flowing Hay River "goes out" before the lake, river ice is often piled against the lake ice creating a jam and flooding over the delta. In 1963 the lake was later than usual in breaking up and the spring melt heavier. Extensive flooding occurred on Vale Island which is only ten feet above lake level. This did considerable damage and precipitated the establishment of a new subdivision on the mainland.

The end of the season is usually October 5th when ice forms in bays and prevents further navigation. The lake, however, may not

total number of degrees below 65^oF. D.O.T., Meteorological Branch, Toronto, 1960.

²⁰L. S. Bourne, Yellowknife, N.W.T., a Study of its Urban and Regional Economy, Northern Coordination and Research Centre, Dept. of Northern Affairs and National Resources, Ottawa, 1963, p. 20.

freeze completely until late December.²¹

The period of break-up and freeze-up not only limits transportation, as the Mackenzie crossing is closed, but also prevents fishing for some two and a half months each year.

Permafrost

With a mean annual temperature of 24.1°F Hay River lies outside the area of continuous permafrost which has a mean annual temperature of 23°F as its southern boundary.²² It is within the discontinuous permafrost belt, which is often more troublesome and about which Brown says, "distributions of individual islands appear to be conditioned by variations in local microclimate and terrain features such as relief, drainage and snow cover."²³ In the Hay River area Leahey found permafrost absent under mineral soils but common in organic ones, particularly peat with sphagnum moss cover. Although precise distribution is not known, knowledge of it is increasing with the growing number of test bores.

Much of the Hay River permafrost is of the rotten, disintegrating type, although in places pure ice may be encountered. It will frequently disappear or the permafrost table be lowered with clearing

²¹D. S. Rawson, "Physical Limnology of the Great Slave Lake," Fish. Res. B'd Journ. Canada, vol. 8, 1950-52, p. 12.

²²J. L. Jeness, "Permafrost in Canada," Arctic, vol. 2, Sept. 1949, pp. 13-27.

²³R. J. E. Brown, Distribution of permafrost in the Discontinuous Zone of Western Canada, paper presented at the Canadian Regional Permafrost Conference, Edmonton, Dec. 1-2, 1964.



3. Discontinuous permafrost is a problem in Hay River. This R. C. M. P. barracks has been built on wooden piles.



4. When permafrost thaws a particularly fluid layer may result, and buildings sag and sink.

and a consequent rise in soil temperature. It is found at depths ranging from eighteen inches on Vale Island to three feet at Mile Two and at the border.²⁴ A report on test drilling in the new subdivision on the mainland indicated that permafrost existed in seven of nine boreholes and generally existed to depths of twelve to fifteen feet; below this was either a "soft plastic mass" or "frozen gravel."²⁵

The economic effects of permafrost are well known, and considerable work is being done on methods of overcoming some of the problems. Ramifications are an increase in construction costs with the need for preliminary survey, special piling methods and the use of gravel pads. Where permafrost is thawing, as in parts of Hay River, there is also the problem of the creation of a soft, low strength material.²⁶ In the servicing of communities problems are encountered in the installation of sewer and water mains and the construction and location of highways. Specific problems of the discontinuous belt are indicated by E. L. Long, who says "structures must avoid the edges of discontinuous permafrost and must be designed to assure a stable permafrost layer both under and around structures."²⁷ Thus buildings

²⁴A. Leahey, op. cit., p. 20.

²⁵Canada, Dept. Public Works, Edmonton, unpub. report on site conditions on the New Federal Building Site, 1964, 5 pp.

²⁶Loc. cit.

²⁷E. L. Long, Alaska District Engineer's Experience in Areas of Marginal Permafrost, paper presented at the Canadian Regional Permafrost Conference, Edmonton, Dec. 1-2, 1964. Several other valuable papers dealing with this topic were presented at this conference.

located with one corner on permafrost will sag or sink.

In the detailed planning of communities like Hay River and the construction and maintenance of highways, these aspects came into consideration; the area must be examined thoroughly and the proper measures taken, particularly for buildings of more than two storeys or with basements.

Summary

This, then, is Hay River in its physical setting. Clearly some factors have been of greater importance than others in the development of the town. The severe climate and poor soils have always imposed limitations and difficulties on the community, but it is only in recent times, with the accelerated growth resulting in more substantial buildings, the need for roads and runways and the demand for piped water and sewage system, that factors such as permafrost and the nature of surficial deposits have become important. The flooding problem also took on a more serious aspect when development meant location on the low-lying Vale Island and was an important consideration in the search for a new residential site in 1963. It is significant that in modern planning and consequent development more and more aspects of the physical environment need to be taken into consideration.

CHAPTER II

DEVELOPMENT OF HAY RIVER

Part 1. Early Growth 1840 - 1940

The reasons for the growth and existence of a community in the Hay River delta owe much more to history and human effort than to physical setting. The period 1840 to 1940 provides a picture of early Hay River, when the town's growth was dominated by missionary activity and water transport.

By the early nineteenth century the western part of Great Slave Lake was well-known to fur traders, moving down the Slave and Mackenzie Rivers.¹ The trade route along the southern shore of the lake and down the Mackenzie led to the establishment of Forts Resolution and Simpson in 1804.² Simpson was a major depot point where goods were relayed northwards and furs collected; Resolution, a route focus, was the fur packing centre and provided timber, vegetables, potatoes and butter for the northern posts.

Hay River was a late development in the Mackenzie Valley. The first recorded post was in 1845 and continuous settlement began in 1893. There was little reason for a post at the mouth of the Hay

¹ See H. A. Innis, Fur Trade in Canada, Toronto, 1962, 232 pp., G. R. Rae, Settlement of the Great Slave Lake Frontier, N. W. T., Canada, from the Eighteenth to Twentieth Century, unpub. Ph. D. thesis, Dept. of Geography, University of Michigan, Ann Arbor, 1963, 356 pp.

² Fort Simpson was so named in 1850, before this it was Fort of the Forks; Fort Resolution was so named in 1821, previously known as Slave Fort.

River before this; hunting and trapping was poor, it was not a large Indian encampment, there is little good timber near the lake and it was certainly not a route focus. It is, however, the only sheltered harbour along the southern shore of the main lake, and this fact became more important as vessels grew larger.

In 1845 there was a small post where the Hay River splits into its two main channels;³ it existed to trade with the Indians and provided a refuge for York boats on this dangerous stretch of water. By 1849 Big Island Fort, with its fishery, was established,⁴ and the Hay River post was closed. Contemporary with the establishment of Fort Smith, Hudson's Bay Company reopened the post in 1868, and this probably continued to operate until 1875.⁵ It closed due to paucity of trade with the migratory Indians. During this time the Roman Catholic mission of St. Ann was established near the present Indian village, but only operated in 1869; for the rest of the time visits were made from Fort Providence.⁶

As an early trading post then, Hay River was minor and had limited success, but probably remained an Indian summer camp, based on the excellence of local fishing. It continued to be a shelter on the

³F. Voorhis, Historic Forts and Trading Posts, Canada, Dept. of Interior, National Development Branch, Ottawa, 1930.

⁴G. R. Rae, op. cit., p. 212. In 1868 Fort Providence was established and Big Island closed.

⁵Most sources give 1872, but records of the Mission of St. Ann at Hay River indicate 1875.

⁶Unpublished records, Mission of St. Ann, Hay River, 1965.

southern shore, and with the coming of steam to the lake in 1886 (the screw-propelled, wood-burning H. B. C. "Wrigley"), the river mouth became a refuelling stop.

Impetus for the beginning of continuous settlement came from the Indians. In 1892 an Indian named Chatelaine brought his people to live permanently at the mouth of the Hay River; he "built houses and kept animals."⁷ Because of pressure from other missions, Bishop Grouard was unable to comply with his request for a priest. Thus the Anglican records state that on June 29th 1893, "Indians of the Tenni or Slavi Tribe asked Bishop W. D. Reeve for a missionary, Mr. T. G. Marsh was sent."⁸ The latter came from Fort Liard and by May 1894 the Mission House (still standing in 1965) was erected at the mouth of the Hay River, on the right bank; St. Peter's mission and school was established.

The settlement grew slowly. In 1895, the Hudson's Bay Company re-established and the Anglican "school" of six pupils came from Resolution. By 1897 there were six workers attached to the mission, including two teachers and a nurse operating a small dispensary. The Roman Catholics came in 1900 when a lot was bought and a house and small church built. Treaty Number Eight was signed with

⁷Loc. cit.

⁸Parish History, St. Peter's Mission, Hay River, June, 1965.



5. Hay River in 1933 looking east. This is the mission and Indian village in its heyday. Note the low lying and wet nature of Vale Island in the foreground. (Photo from G. R. Rae)



6. Hay River, Indian village in 1965. Some buildings have been moved and St. Peter's School has disappeared, but the village is much as it has been since 1900.

the Indians in 1898. A three-storey residential school was built by the Anglicans, and in service by 1917, and together with churches formed the major buildings of the settlement.

In the 1920's the fur boom brought three independent traders to Hay River, one of whom continued in operation until 1939. The R. C. M. P. had a post there between 1925 and 1927; this was re-established in 1933, and has continued since. In 1930 an eight bed nursing station was built by the Anglicans.

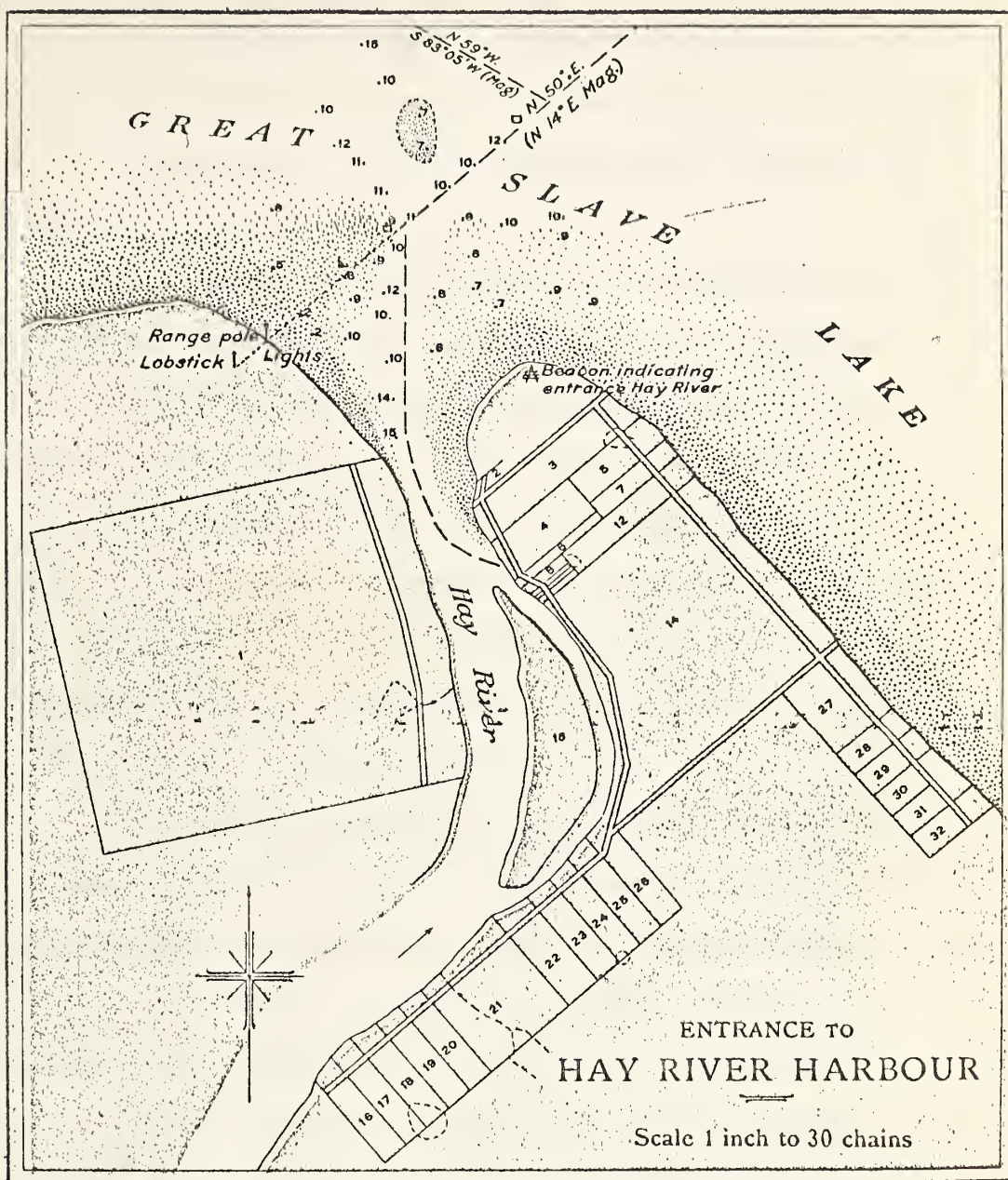
Throughout the period population varied between about 140 and 180 (see Figure 6). In 1931 the total population was 171, of which 33 were whites.⁹ By 1941 the number of whites had fallen to 16. The Indian population grew steadily through the period, from 103 in 1903 to 147 in 1940.¹⁰

By the 1920's the settlement had taken on the form which was to characterize it until 1948 (see Plates 5 and 6, and Figure 4). Located on the east bank of the Hay River delta, the village was some fifteen to twenty feet above the level of the lake, in an area of low, scrubby trees predominantly willow and spruce. It is an area of slightly better developed soil, and above the general level of spring flooding. Situated on the river bank, it became a linear type of settlement; its major axis was the dirt track paralleling the river. In 1944

⁹F. G. Ridge, General Principles for the Planning of Sub-Arctic Settlements, unpub. Ph. D. thesis, Dept. of Geography, McGill University, 1953, p. 426.

¹⁰M. J. Robinson "Exploration and Settlement of Mackenzie District, N. W. T." Can. Geogr. Journ., July, 1946. G. Taylor, "A Mackenzie Domesday" in C. A. Dawson, New North West, Toronto, 1947, p. 51.

HAY RIVER, 1922



SOURCES OF INFORMATION

Survey of Great Slave lake by
 Topographical Survey of Canada, 1921.
 Other information from official plans by
 Geological Survey of Canada
 and other available records.

1923 EDITION, CORRECTED TO 1st DECEMBER, 1922

Taylor considered the settlement "sub-infantile", the buildings arranged in a haphazard fashion, and typical of Mackenzie Valley settlements.¹¹ It is interesting to note that survey had allowed for considerable expansion, even including a portion of Vale Island (Figure 4).

The settlement was dominated by the Missions, and particularly by St. Peter's School, under Canon Vale. Operating for twenty years, the school had provision for over fifty children up to sixteen years old, and had a "faculty" of five and a staff of three. Pupils came from all over the North and included Eskimos from Aklavik and Coronation Gulf, and Indians from the whole Mackenzie area. Although smaller than the Roman Catholic School at Fort Providence, it was of considerable importance, and the influence of Hay River was felt throughout the North.

The missions provided the only real gainful employment for Indians in lieu of trapping and hunting which was their mainstay. Considerable help was needed from the natives, particularly in janitorial work, providing wood and helping with the fishing. However, the natives would frequently pursue their own activities and ignore the mission, indicating that their temperament and unreliability were a problem then as now.¹² Also the school was the reason for the presence of several whites; the bulk of supplies brought in by steamer

¹¹G. Taylor, op. cit., p. 51.

¹²Annual letter, Canon Vale, Dec. 1920.

were for the school; and pupils made up the greater part of the passenger traffic. However to the local native the fur trading post was of more direct importance.

With the need to supply the missions, the school and the small hospital with food, gardens were an important feature of early Hay River. Totalling some eight acres there were ten gardens;¹³ the three major ones were connected with the School, the Roman Catholic Mission and Hudson's Bay Post. Cameron in 1910,¹⁴ who thought Hay River "the most attractive mission in the whole North," recorded the taking of one thousand bushels of potatoes, fifteen of turnips, five of beets and five of carrots. Albright in 1930 indicated four hundred bushels of potatoes, as well as fodder corn and alfalfa up to two feet high and early wheat up to four feet had been produced.¹⁵ Thus on these better developed soils and with the long summer daylight agriculture was possible. Barley, celery, tomatoes, rhubarb and cabbage were also produced.

In these early days of self-sufficient and self-sustaining communities, it is false to talk of functions in a regional sense. Not until the very end of this period was Hay River any more than an educational centre and a minor point where furs were traded and collected. The paucity and slowness of the transportation system

¹³W. Dickson, "Northern Agriculture," in C. A. Dawson (ed.), op. cit., p. 162.

¹⁴A. D. Cameron, The New North, New York, 1910, p. 72.

¹⁵W. D. Albright, "Gardens of the Mackenzie," Geogr. Review, Jan. 1930, p. 11.

added to this lack of regional linkage and interdependence. The major link with the "outside" was by water and through the McMurray rail-head. Freight came down the Slave River from Fort Smith and along the southern shore of Great Slave Lake, calling at Hay River, at first once yearly; but later, with the appearance of H. B. C. "Distributor" in 1920 and the reconditioning of H. B. C. "Mackenzie River" in 1929 deliveries were made four times each summer. Of course the major flow of traffic went on down the Mackenzie. After 1934 a major route from Fort Smith crossed the lake to the booming Yellowknife, and this became the main centre of activity on the lake.

Low water on the Slave River in 1938 in the Fort Chipewyan area meant a failure of necessary freight to reach Yellowknife. Thus in winter 1938-39, a tractor trail was pushed through from Grimshaw in the Peace River area to Hay River, and across the lake, via Fort Resolution, to Yellowknife. This trail used until 1942 brought a new dimension to the position of Hay River and was a portent of things to come.

In the lake area generally Hay River was not very important. Fort Smith, a break-of-bulk point was the administrative centre, and grew with the increasing freight of the thirties. Fort Providence had a larger school, a more successful garden and a larger Indian band. After 1934 the lake was dominated by the mining boom town of Yellowknife developing on the north shore. By 1937, Hay River had begun to decline; in that year the school was moved to Aklavik, with most of its staff. By 1940 it was a small Indian settlement struggling to live in the traditional manner, and with only sixteen metis and whites.

Many of the problems of early Hay River are still evident today. Transportation was the major one, and goods moved slowly; in 1919 a supply bale took two and a half years to reach Hay River from Eastern Canada.¹⁶ Thus in terms of food supply the gardens were crucial. Later the transportation system was better, especially with the greater number of companies operating in the thirties, and as today an increasing amount and diversity of goods were brought from the "outside". Costs, however, were high; in 1907 freight was ten cents per pound (today it is twenty).¹⁷ Problems of building and heating costs were also present. In 1893, whilst putting in his basement, Mr. Marsh struck permafrost at three feet. In 1920 an expensive heating system was in operation in the school, incorporating a gas engine and furnaces. There was a high turnover in staff at the school and of course getting workers was a considerable problem. In the twenties a young female teacher bathed in the river wearing a one piece bathing suit; not only was the Indian Chief shocked, but he refused to drink any water taken from the river! Thus the problem of Indian adjustment to fast changing ideas and attitudes of white society was seen then as now.

This, then, is old Hay River, centred around the missions and primarily an Indian settlement. It was, despite improvements, isolated,

¹⁶ A. J. Vale, op. cit.

¹⁷ A. J. Vale, Concerning my Life in the Church, Toronto, 1947, p. 6.

distant and very much on the frontier of settlement. It formed the first nucleus of the town, and remains today, morphologically almost unchanged, on the east bank of the river, known as the "Indian Village."

Part 2. Development of Modern Hay River 1940 - 1960

By 1960 Hay River had become a modern sub-arctic community, and was second only to Yellowknife as a developing community in the Mackenzie Valley. To begin with, the growth of Hay River was linked to that of Yellowknife across the lake, particularly to its post-war boom. Gradually however, this influence lessened and Hay River began to develop independently, until in 1960, when the Yellowknife Highway linked Yellowknife by road to the South, it was very definitely a town in its own right.

The Grimshaw to Hay River tractor trail of 1939. hardly affected Hay River at all; the settlement was merely another point on the route to Yellowknife. Essentially a stop-gap measure, the trail was unusable by 1942. Continuous use of this new route to the Great Slave Lake settlements dates from wartime, when the trail was re-opened in winter 1942-3. In 1942 three times the normal tonnage (which was about 12,000 tons) moved on the Mackenzie waterway. At the close of navigation much urgent freight for the Canol project had not been moved.¹⁸ Thus the route to Hay River was re-opened, with

¹⁸T. Lloyd, "The Mackenzie Waterway: A Northern Supply Route," Geogr. Review, July 1943, pp. 415 - 434; and also "Oil in the Mackenzie Valley," Geogr. Review, March 1944, pp. 275 - 307.

a link to Fort Smith and an extension down the Mackenzie to Norman Wells. The section to Hay River remained in general use until 1948.

The necessity in the Canol Project for transportation of men, establishing communications and providing emergency landing strips, meant the construction of airstrips at strategic points down the Mackenzie Valley. Two dirt runways were operational by autumn, 1942 located close to Hay River on the south side of Vale Island (the best drained site on the island). For the first time wheeled aircraft operated in the Northwest Territories. Along with the airstrip a radio and meteorological station was put into operation. In 1944 the airport was handed over to the Canadian government and continued in limited use, with part of the tractor trail linking it to the village on the east bank. With the continuance of the signal Station white population rose to thirty-three in 1946.¹⁹

(a) Post War Developments and Coming of Mackenzie Highway

By 1946 the post war boom in Yellowknife had made it the largest and fastest-growing town in the Mackenzie area, with a population of 3000.²⁰ In view of this the Federal Government made three decisions; to establish a new townsite for Yellowknife; to build an airport there; and in order to alleviate the transport problem and allow commercial fishing to expand, to build an all-weather gravel highway

¹⁹G. R. Rae, op. cit., p. 417.

²⁰J. L. Robinson, op. cit., p. 49.

from the Grimshaw railhead, in the Peace River area, to Hay River. This joint venture of the Dominion and Alberta Governments was completed and passable by August 27th, 1948. Although tractor trains operated in the winters of 1946 and 1947, bringing supplies for Hay River and Yellowknife and fishermen to the lake, it is with the completion of the road that the boom of Hay River began.

In 1948 and early 1949 a considerable "rush" of people took place; already by the end of 1948 the white resident population had risen to 325, and the transient population had reached 900!²¹ Most of these were fishermen and construction workers, but there were also people engaged in transport and some hoping to set up businesses. Many were drifters and "marginals" attracted, as ever, by the possibilities of a new pioneer town. A burst of building activity took place as the new town developed on the east side of Vale Island where the new highway ended. Thus the completion of the Mackenzie Highway meant the creation of a second nucleus for Hay River. By the winter of 1948-9 the "long lots" and waterfront lots along Mackenzie Drive* were laid out as well as blocks A, B, C and D (the rest of the 1948 townsite, see Figure 5). With the rapid development of fishing during 1949 a Government decision was taken to locate the fish plants away from the main settlement as fish processing was considered unhealthy. Thus the West Channel fishing village, a third nucleus, came into being as fishermen chose to reside near the fish plants. Almost from inception then modern Hay River was a fragmented town.

²¹G. R. Rae, op. cit., p. 421.

*The portion of the Mackenzie Highway that was later to become the main street of the settlement.

However, two companies active before 1949 did not move and remained in the main townsite, where one was still located in 1965. Along the waterfront primitive docking and trans-shipment facilities were built as well as expanded facilities of the Imperial Oil bulk storage plant.²² On the northeast corner of the island the Public Works Department laid out the dredge site and began dredging operations in the channel.

In 1949 Hay River became an Administrative District with a Board of Trustees and a Municipal Council of three elected and four appointed members chaired by the Area Administrator. By this time resident population was 400 whites and an estimated 1500 transients.²³

It was undoubtedly the potential of an almost virgin lake that attracted most of the people in the early fifties. They came mainly from other inland fishing areas, Northern Alberta, Northern Saskatchewan and Manitoba. After the taking of the big fish many became disappointed and soon left, but some stayed and continued fishing whilst others merged into the general labour force. In 1965, 23 per cent of the white, male labour force had originally been active fishermen, but had changed employment.²⁴

The years 1949 to 1955 saw the main fishing boom. The highway converted the Great Slave Lake fishery from a specialized, water-borne, frozen-fish operation to a land-based (in Hay River) fresh-fish industry linked by truck to its market. In 1949 a record number of ten

²²An oil tank farm had been constructed in 1946, to supply highway crews, and local requirements.

²³G. R. Rae, op. cit., p. 421.

²⁴Pers. comm. J. J. Keleher, Fisheries Research Board, Hay River, July 1965.

companies operated, with eight processing plants; the number of boats used in the summer fishery jumped from 21 in 1948 to 63 in 1949.²⁵ The tremendous increase in catch can be seen in Table XX, and market value rose from \$500,000 in 1947 to a high of \$2,300,000 in 1950. The number of men fluctuated widely but there does seem to have been a general increase and there were never less than 200 men involved in any one year. The number of commercial fishing licenses issued rose from 300 in 1950 to over 600 in 1954 and 1955, but by 1957 it was back to the 300 mark.²⁶

(b) Growth 1949 - 1960

The other major factor in the development of Hay River was its importance as a transport centre, and this, unlike fishing, has continued to grow slowly. Perhaps the most important influence here was Yellowknife Transportation Co., Ltd. Originally operating tractor trains from Grimshaw to Yellowknife, by 1949 the company was an important waterborne common carrier on the Mackenzie waterway,²⁷ and the location of facilities in Hay River in 1949 meant much to the growing town. Initially Yellowknife Transportation carried only 5 per

²⁵ J. J. Keleher, "Great Slave Lake Fishing Fleet 1945 - 1963," Canadian Fisherman, Feb. 1965, p. 1.

²⁶ Canada, Dept. of Fisheries, Winnipeg. Although a licence is necessary to fish on Great Slave Lake, it is only a general indicator, as not all licencees fish, and separate licences are issued for winter and summer fishing, often to the same persons.

²⁷ Y. T. also continued to operate winter tractor trains throughout the fifties.

cent of the total freight moved on the Mackenzie system and concentrated on freight destined for Yellowknife. Thus between 1949 and 1953 Y. T. "Expeditor" made runs twice a week between Hay River and Yellowknife, carrying both passengers and freight. However, the bulk of freight carried was bulk petroleum and products; in 1957 some 76 per cent of Y. T. 's freight was petroleum products shipped both from Norman Wells and Hay River. By this time the company carried about 20 per cent of the total Mackenzie freight and, in fact, the port of Hay River was increasingly important in north bound traffic in the Northwest Territories.

Oil handling facilities expanded to three tank farms primarily concerned with transshipping oil for Yellowknife and points north, mainly petroleum products which Norman Wells was unable to supply. With the demand for fuel after 1947, oil was trucked up from Edmonton and barged to Yellowknife. In 1957 a total of 13,928 tons of petroleum moved north through Hay River, 8,376 tons to Yellowknife, 950 to Fort Smith, 703 to Fort Simpson, 728 to Norman Wells and 3,169 to points north of Norman Wells.²⁸ Oil also moved south through Hay River from Norman Wells; in 1953 some 2,500 tons were trucked from Hay River to Peace River.

By volume, Hay River was the most important port in the

²⁸ V. Salyzyn, Transportation as a Limiting Factor in Economic Development: Mackenzie District, Canada's Northwest, unpub. M.A. thesis, Dept. of Political Economy, University of Alberta, 1958, 97 pp.



7. Hay River in 1953, just after the "boom" period. Note the gaps in the gridiron pattern and the waterfront activity. Mackenzie Drive parallels the river bank. (Rae, 1964)



8. West Channel fishing village in 1965, established in 1949 by government decision and little changed since.

100 pages 5 to 60
100 pages 5 to 60

Northwest Territories in 1957 and here some six tugs and twenty-one barges were based. However, specialization in bulk petroleum meant that little general freight was carried until the 1960's. Most of the general freight was carried by the Northern Transportation Co., Ltd. which, until the 1960's operated through Fort Smith and the Waterways railhead. Thus of general freight received at Giant Mines Yellowknife in 1955, 3,277 tons came via Waterways, and only 22 tons via Hay River by water.²⁹

The transportation function of the town continued to grow. An important element of this was trucking from the south, in this period mainly by Grimshaw Trucking and Distributing Co. Ltd. Goods were moved north to link into the general northern supply system with Hay River a break-of-bulk point. As today, the main south bound freight was fish (in the early days shipped by the fishing companies themselves) and empty beer bottles.

Much more than fishing, transportation was responsible for the growth of facilities in Hay River; obviously docking and warehousing were an important element, but also hotel, restaurant and retail outlets developed. In general the fishing companies trucked in supplies direct from Edmonton and did not use local sources, except for fuel, and the fishermen were normally out on the lake.

As a commercial and service centre Hay River grew only

²⁹L. S. Bourne, Yellowknife, N. W. T. A Study of its Urban and Regional Economy, Northern Coordination and Research Centre, Dept. of Northern Affairs and National Resources, Ottawa, 1963, p. 97.

slowly, and after the initial boom there does seem to have been a considerable period of stagnation. Both the major bases of the town, fishing and transportation, were subject to fluctuations. This led in turn to the ephemeral nature of most small businesses in the town, closed one year, open the next. Also lack of immediate capital on the part of most residents meant the necessary extension of long-term credit facilities which the bank, of course, would not meet without security. which did not exist in early Hay River. This contributed to the transitory nature of the town and its population. This led to pessimism about Hay River, as the annual reports of the Area Administrator reveal.³⁰ In 1953 it was considered that the town had reached its maximum growth unless some other activity came in; later in the same year it was reported that Hay River would "fade away" without a boost in its economy. That it did not do so is largely due to the inertia of the population, many of whom for a variety of reasons just stayed on. Thus when development returned in the post-1960 period people were there and available, ready to make the most of it.

In 1954 the population seems to have fallen slightly to 400 resident whites and only 200 transients. However, throughout the fifties, the population grew slowly; in 1956 it was up to 850 white residents and by 1960 it was over 1,200 including Indians.³¹ These

³⁰ Courtesy Mr. F. E. White, Area Administrator, Hay River.

³¹ Figures from unpublished Mss. Hay River Chamber of Commerce, 1961, 7 pp.

latter remained between 140 and 160 throughout the period. By 1960 the total labour force of the town was approximately 400.

By 1960 most of the town's facilities were established including: four fish processing plants, Y. T.'s repair and service engineering and small dockyard, a small N. T. wharf, two trucking companies, Shell, B. A. and Pacific 66 oil tank farms (a reflection of the growing domestic oil and fuel market), three garages, an eighteen-room hotel, five restaurants and cafes, one bank, a post office, five general stores and one hardware, one pool hall, one theatre and six general contracting firms. Also several government departments had located here; the Department of Fisheries, Department of Public Works, Indian Affairs, Fisheries Research Board and Northern Affairs and Natural Resources.

The community had had a direct bus service to Edmonton, down the Mackenzie Highway, since 1955 and air traffic was expanding. In 1957 Pacific Western Airlines took over from Canadian Pacific as the major air carrier; in that year 1,400,000 pounds of air freight were carried into Hay River.

In terms of areal extent the growth of the town was slight, and can be seen from Figure 5. In appearance the town was a loose agglomeration of shanty-like building; the rule was a one-storey shack, particularly in the West Channel. Larger houses and buildings required careful construction because of permafrost. Driving piles into the permafrost was the usual solution and a few examples of better housing did exist, particularly between the West Channel and

the main settlement. The commercial zone was strung out along Mackenzie Drive³² in a scattered fashion, partially due to the thought that Hay River would develop into a much larger community than it has yet done and partially due to land speculation in the early fifties which led to elongation. The unsuitability of the gridiron pattern to the area, which has much swamp, muskeg and unsuitable land, resulted in large gaps in the housing area, mainly west of Mackenzie Drive.³³ In short the main part of the settlement was hardly compact but rather, straggly and discontinuous.

Three major centres of concentration had emerged. Throughout all this the Indian village on the mainland had remained untouched, although in 1957 the old residential school had been pulled down and by 1960 the nursing station had been moved to Vale Island. It became a native settlement almost entirely which unfortunately increased the Indian problem through segregation. The main settlement on the east side of Vale Island, was the main commercial and population nucleus. The West Channel was almost entirely a fishing village. Thus there was no consolidated Hay River townsite but a series of developments.

By 1960, then, Hay River had taken on much of its present form. Although still closely linked with the growth of Yellowknife

³² The portion of the Mackenzie Highway passing through the town.

³³ F. G. Ridge, General Principles for the Planning of Sub-arctic Settlements, unpub. Ph.D. Thesis, Dept. of Geography, McGill University, 1953, p. 476.

across the lake, it was slowly emerging as a northern distribution centre. It had also achieved a certain stability and some diversity of economic activity. The population had reached twelve hundred and size alone was sufficient to ensure some growth.



9. Air view of Hay River looking north-east in 1965. Note oil tank farms along the waterfront and the sprawling nature of Vale Island town site.



10. Looking down the Main Channel of the Hay River. The Great Slave Lake Railway and new marshalling yard is in the foreground.

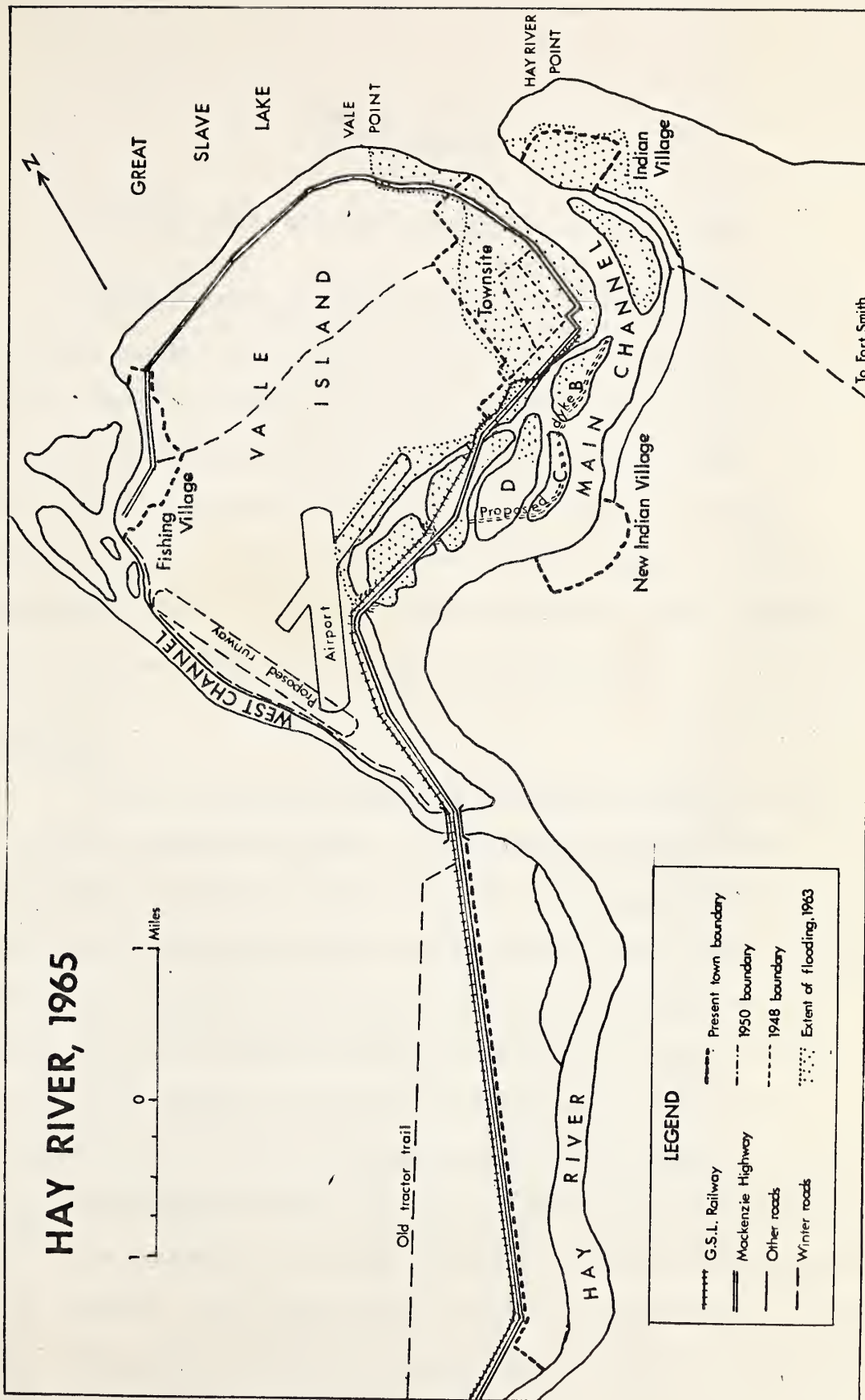


Figure 5

CHAPTER III

THE NATURE OF THE COMMUNITY 1960 - 1965

Although modern Hay River is not yet twenty years old, it has grown rapidly and changed considerably since 1948. During the 1960's it has lost much of its pioneer-frontier nature and has taken on some of the characteristics of settlements further south. It is not sufficient to categorise Hay River as a northern community despite its location within the Northwest Territories. A close examination will reveal greater affinity with the average Canadian small town than might be expected from its location.

Population

Before considering population in detail it is well to point out certain significant features. The Municipal District of Hay River defines a resident of the community as a person residing in the town for not less than eight months in each year, unlike Alberta where twelve months is more usual. Each year the town sees a sizeable influx of seasonal workers and sometimes their families. More than half of these transients connected with transportation, communication and construction do not stay or work in the town but are spread through the area. They do visit the town from time to time, use its facilities and swell the numbers of people, particularly in the summer. The fishing industry is also a special case. In both winter and summer seasons about half those employed are not ordinarily resident in Hay River.

A survey carried out in summer 1965 indicated the resident population of the town to be 1991,¹ and a summer transient population living in the town of one hundred and fifty. Total population has risen by 48 per cent since 1961 when it was 1,338; it seems to be rising at a rate of about 10 per cent per year (see Table I). The 16 per cent growth of 1962 seems related to a year of general expansion, whilst the "low" of 1964 is possibly due to the flood of 1963 (see later section).

TABLE I - POPULATION GROWTH HAY RIVER 1961-1965

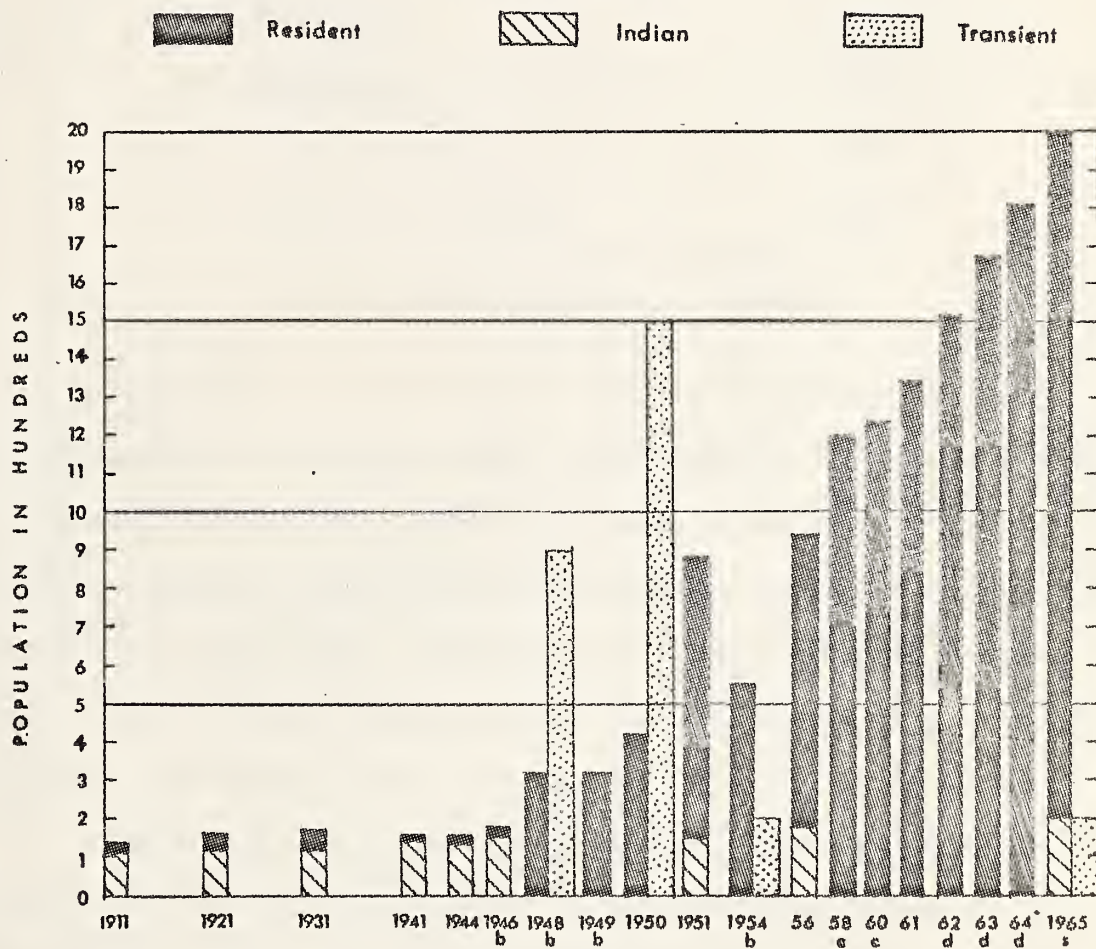
	1961	1962	1963	1964	1965
Total population	1338	1522	1679	1808	1991
Per cent increase		16	10	7	10

Source: School records, Hay River.

Since 1948 the total population has increased by 512 per cent. The initial increase fell off slightly in 1954 with the general disappearance of boom conditions; from 1956, however, the population has grown fairly steadily. To put the growth in perspective comparison is necessary. Recent growth rates for other communities are not readily available but Hay River's growth in the last ten years, 105 per cent, is close to that of Grimshaw 1951 - 1961 (see Table II).

¹Based on records of the T. B. Survey carried out in 1964 and 1965, courtesy Miss M. Parks, Nurse-in-charge, Health Centre, Hay River, and a survey of commercial enterprises in the town.

POPULATION, HAY RIVER, SELECTED YEARS - 1911 - 1965



Sources: a G. Taylor, 1947
 b G. R. Rae, 1964
 c Hay River Chamber of Commerce
 d Schadt Records
 s Field survey
 Otherwise Census of Canada

Figure 6

TABLE II - GROWTH RATES 1951-1961

Hay River	68%
Peace River	50%
Edson	63%
Edmonton	76%
Grimshaw	96%
Grande Prairie	200%
Hay River, 1956-65	105%

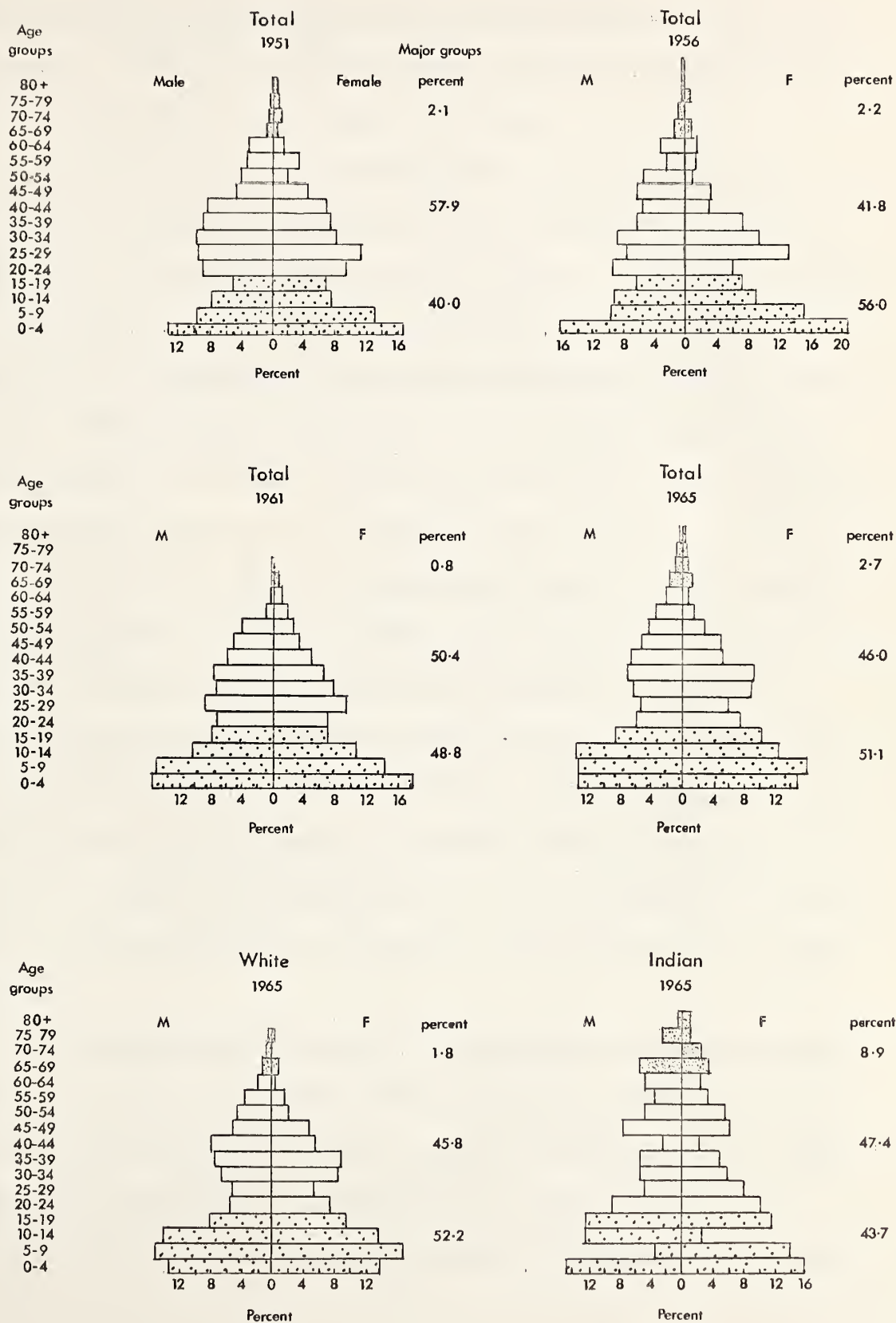
Source: Alberta Bureau of Statistics.

The number of transients is not easy to estimate, but the figures available, based on earlier works, indicate the present number is quite low. Clearly the number of transients was highest during the early boom period. Recent staking and drilling activity has increased the number; winter 1965 - 1966 saw a rise to 400. Hay River will always have a transient population but it is unlikely, in normal circumstances to exceed 20 per cent of the total.

In June 1965 the Indian population was 206 or about 80 families, 10 per cent of the total population.² In the Northwest Territories as a whole Indians make up more than 20 per cent of the total population. This illustrates the high percentage of whites and metis in Hay River. Unfortunately it was impossible to establish the number of metis in the

²Pers. comm., J. Audibert, Indian Agent, Hay River, 1965.

POPULATION PYRAMIDS, HAY RIVER 1951-1965



Source: Census of Canada, Field survey 1965

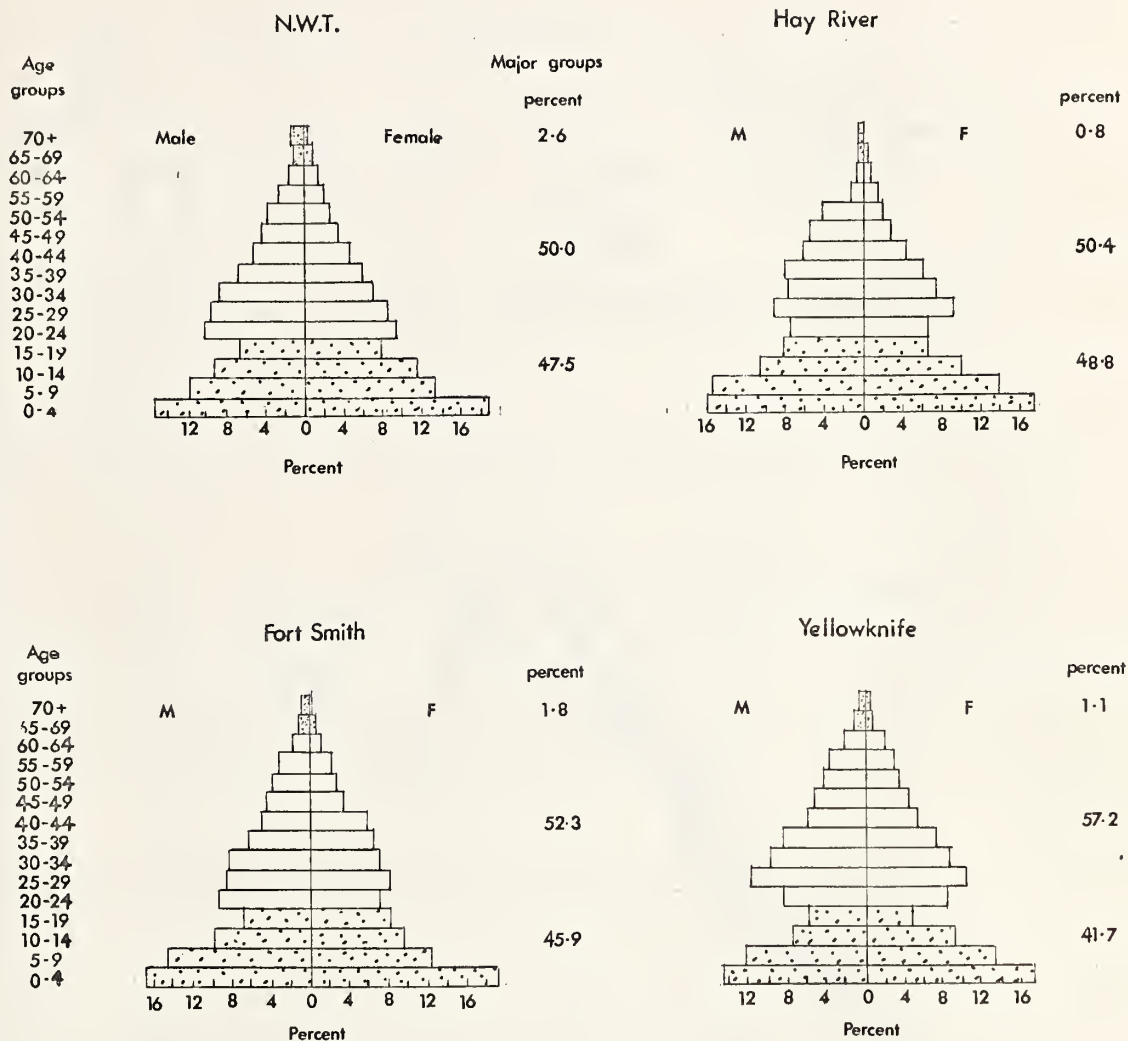
Figure 7

town, however an estimate puts them at about the same number as the Indians. With immigration the white segment of the population is growing much more quickly than is the native.

In age and sex structure Hay River shows much the same general characteristics as the other major settlements in the area (Figure 8). There is a large number of children, particularly below 10 years old. Hay River shows the greatest deviation from the Canadian figure and closest approximation to the Northwest Territories' average. This indicates that families are generally young and that itinerant whites are mainly young with young children; it also reflects the high native birth rate. The striking "loss" in the 15 - 19 age group reflects the tendency of young people to leave for the "outside" to get employment; and also the high infant mortality rate among natives. In contrast to Fort Smith both Yellowknife and Hay River show a large percentage in the 25 - 29 age group due to in-migration of an important element of the labour force. All three pyramids show the low percentage of old people associated with the north, Hay River being the smallest, which indicates the recency of Hay River's development and the undesirability, at present, of the community as a retirement spot.

The dominance of males in the population, frequently associated with northern communities, was more marked in Hay River (57 per cent) and Yellowknife (56 per cent) than Fort Smith (53 per cent). In the case of Hay River this percentage has shown a tendency to decrease over the years from 64 per cent in 1951 through 60 per cent

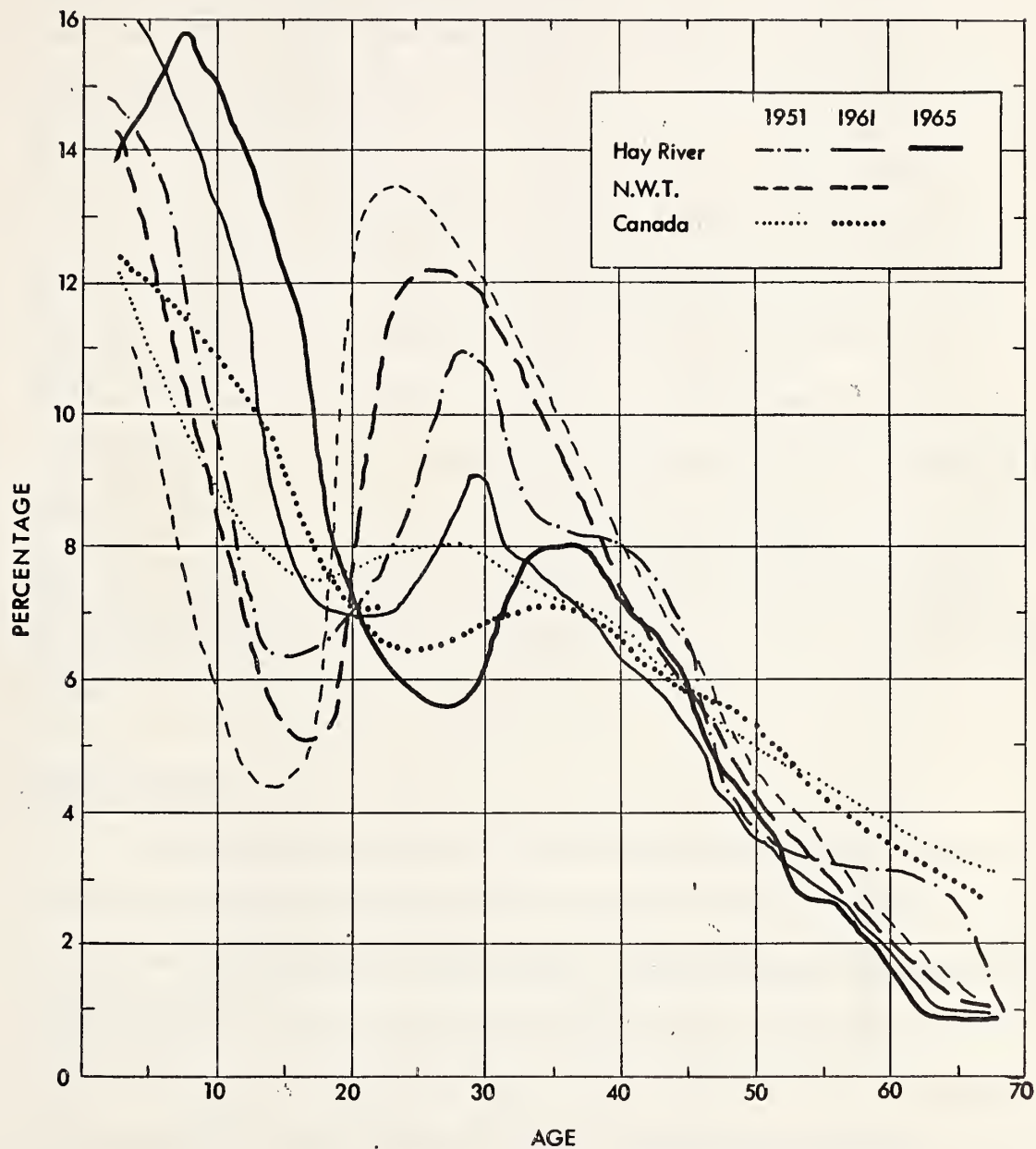
POPULATION PYRAMIDS, 1961



Source: Census of Canada

Figure 8

PERCENTAGE DISTRIBUTION BY AGE OF WHITE POPULATION, Hay River, N.W.T., Canada



Source: adapted from N.W.T. Today

Figure 9

in 1956, 57 per cent in 1961 to 53 per cent in 1965.³

The picture for Hay River alone is given in Figure 7. The 1965 pyramid shows an increase in the number of old people and children; the former shows the importance of native old people, and the latter group has grown since 1951 when it was 40 per cent. The greatest "loss" was not in the 15 - 19 age group but, surprisingly, in the 25 - 29 age group, particularly females; there is a distinct lack of young, single females. The relatively high percentage of people between 30 and 44 is probably related to the in-migrations of the mid-fifties, and may also reflect a tendency to settle down later than usual in the north, where employment for young men is often isolated and insecure. The percentage age distribution for whites can be seen in Figure 9. Hay River shows a strong tendency to depart from the Northwest Territories curve and approximate closer to the Canadian curve.

Labour Force

Taking the age group 20 to 65 years as the labour force, it can be seen (Figure 8) that in 1961 Hay River had a smaller percentage than either Yellowknife or Fort Smith, and equals the Canadian figure. From figures 7 and 8 it can be seen that in 1951, with 58 per cent, Hay River was more like Yellowknife in 1961. By 1965 this had fallen to 46 per cent which is lower than the figure for both the Northwest Territories and Canada.

³ Census of Canada, and field survey, July 1965.

The percentage of population in the prime labour force (20 - 44 years) is considered a more significant measure and most important in a region's economy.⁴ In 1961 Hay River had 36 per cent in this category, Yellowknife 42 per cent and Fort Smith 37 per cent; the figure for the Northwest Territories was 39 per cent.⁵ In 1965 the figure for Hay River had fallen to 33 per cent for the total population and 34 per cent for the white population.⁶ Unlike the Northwest Territories as a whole this is not significantly different from the 1961 figure for all Canada, which was 33 per cent.

The rise in the number of females in the total population also means a rise in the female proportion of the labour force. Although in 1961, with 42 per cent of the labour force female, Hay River was below the Northwest Territories figure of 44 per cent; by 1965 Hay River showed 45 per cent. However, this is still well below the national figure of 57 per cent. Of the total labour force actually employed in 1965 some 619, only 15 per cent, were full time female employees.⁷ This is below both the Northwest Territories and national figures where 18

⁴Canada, Dept. of Northern Affairs and National Resources, N. W. T. Today, a reference paper for the Advisory Committee on the Development of Government in the Northwest Territories, Ottawa, 1965, p. 15.

⁵Census of Canada, 1961.

⁶Field Survey, July, 1965.

⁷Field Survey, July, 1965.

per cent and 37 per cent were full time employed females in 1961.

Thus, although no great lack of female labour in the town, there is a lack of possibilities for female employment.

In 1965 the average wage of wage earners was \$3,486 per year, which is a rise of \$135 over the figure for 1961. Persons earning less than \$2,000 per year formed 41 per cent of the total. Although possibly high, this figure nevertheless represents the large numbers of fisherman, labourers and unskilled workers in the resident labour force. Those earning between \$4,000 and \$6,000 per year formed a further 30 per cent of the total. Only 0.5 per cent reported earnings between \$8,000 and \$10,000 per year. Thus, despite the rise in the total labour force and in wage earnings, the large numbers in the lower income bracket remain constant.

TABLE III - WAGES p.a. OF WAGE EARNERS, HAY RIVER, 1965

\$	Per cent	Number
below 2,000	41	220
2,001 - 4,000	19.5	104
4,001 - 6,000	30	160
6,001 - 8,000	9	47
8,001 - 10,000	0.5	3
Totals -	100.0	534

Source: Field Survey, July, 1965.

Per capita income was quite low in 1965, \$935 per year for the total population and \$950 per year for whites alone. Unlike the Territories as a whole this is not due to large numbers of natives, but may be due to the numbers of metis and marginal whites employed in fishing and labouring. Also unlike the Territories, there is not a high proportion of working married females, nor, as a rule are premium wages paid in Hay River.⁸ With the exclusion of fishermen and Indians the average per capita income rises to \$1,300 per year, which is closer to the Territories per capita income in 1961 of \$1,400 per year, yet still below the national figure of \$1,700. The figure, however, may be low as it takes no account of "moonlighting" or supplementary income.

There is a considerable degree of mobility in the labour force, which indicates the flexibility of an unskilled and semi-skilled labour force and the fact that Hay River does offer a variety of enterprises to the worker. The survey carried out, excluding fishermen and senior officials of enterprises which "posted" employees to Hay River, revealed that 70 per cent had been employed by their enterprise for less than three years, and only 2 per cent had been engaged for over ten years. Of the total labour force about 23 per cent were officials either of large companies or of government departments and easily transferable.

Table IV is a picture of the resident labour force. The deficit

⁸N. W. T. Today, op. cit., p. 54.

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of skilled workers is made up by the summer and winter transients. Thus it is common for large companies to bring or send skilled workers to the town on a short-term basis. It is even true that some of the larger construction companies prefer to bring labourers from the south in view of the unreliability and poor quality of local, especially native, labour. Thus, while it is true to say that the skilled, experienced labour force is growing in the town, it is still largely dependent on the influx of outside labour.

TABLE IV - YEARS WORKED AT PRESENT EMPLOYMENT,
HAY RIVER, 1965 *

Years	Per Cent	Number
less than 1	35	85
1 - 3	35	85
3 - 5	19	45
5 - 10	8	18
10 - 15	3	4
Total: --	100.	240

Source: Field Survey, July, 1965

*excludes trappers, fishermen, and officials of large companies resident but available for transfer.

Indians

As previously mentioned natives make up about 10 per cent of the population and with growing white immigration will form a gradually decreasing percentage. With the rapid transition and

growth of Hay River in the last twenty years, the integration and adjustment of the native have been exceedingly difficult. Previous to 1945, automobiles, gravelled highways, the importance of and need for money, and other aspects of white society were foreign to the Hay River Indian. Now he is faced with a growing modern community which is anxious, expectant and optimistic. It seems that both the white and the Indian himself are uncertain as to how he should fit into this society. Physical isolation emphasizes these problems as most Indians live in the Indian village of old Hay River on the east bank of the river although some have been resettled in the west channel, and others in the new sub-division south of Vale Island. The Indian village retains much of the character of Old Hay River; it is still completely unserviced, has no graded roads and living conditions are poor, mainly one or two-roomed shacks. There is a generally ramshackle appearance to the village; in many instances the shacks are in a bad state of repair, and several are abandoned and deserted. In contrast to the more recent nuclei of Hay River it seems a distressing and unhealthy environment. Future plans, however, seem to aim at setting up a new village for the Indians, with better conditions of housing and sanitation, though still on the east bank of the river and probably remaining unserviced.⁹

The basic problem for the native is lack of education and training which is economically gainful in white society. Although Hay

⁹Pers. comm., J. Audibert, Indian Agent, Hay River, June 1965.

River has no vocational school, it does have completely integrated schooling up to grade twelve. However, most Indian children leave at sixteen, having progressed only as far as grade five or six.

Attempts to live by the traditional method are decreasing and more reliance is placed on welfare and relief. Most trap or fish and some manage to supplement this by wage employment in the town, frequently for the local government or in clearing for the larger building and construction programmes. Fire-fighting and guiding also provide some employment. Despite the fact that Hay River offers perhaps the best chance for Indian employment, with its greater measure of economic diversity,¹⁰ incomes are still low. Trapping is notoriously variable; in the last five years average income per trapper, including whites, has varied from \$150 to \$265 per year. Fishing offers one of the best opportunities for Indian employment and it is possible, in a good year, for a single fisherman to earn \$2,000. The Indian Affairs Branch in 1964 initiated a programme of providing two-man yawls, nets and engine for the Indian at a cost of about \$1,500 which the Indian would pay back from his earnings. The scheme has met with some success it seems, and a fishing coöperative has been advocated.¹¹ However, successful fishing demands constant application and long trips away from the village and it is in this respect that

¹⁰ J. Gordon, "Northern Indians, their economic future," North, Sept.-Oct. 1962, pp. 28-34.

¹¹ Sessional paper No. 14, Votes and Proceedings, Council of the Northwest Territories, 28th Session, Frobisher Bay, Nov. 9-14, 1964.

the Indian finds the adoption of white ways most difficult.¹² A limited amount of winter fishing is carried on in Area I (Figure 11) using dog teams to bring back fish. However only about six Indians participated in the commercial winter fishery in 1964-65.¹³ Total Indian income from fishing is probably as much as \$8,000 per year, possibly \$400 per man.¹⁴ The only information on per capita income of Indians available is for 1963 and indicates \$180¹⁵ which is much lower than \$510, the average for Northwest Territory Indians.¹⁶ This figure will probably be higher in 1965, for although there are no skilled Indian workers in Hay River, more Indians are turning to fishing.

Thus among the problems of Hay River is the one of Indian readjustment and resettlement. It seems clear that, as in Canada as a whole, there is no easy and quick solution to the problem of the native; solution must await the Indians' own adjustment which may be fast or slow depending on the younger generation. In Hay River adjustment will undoubtedly lag behind the rest of Canada. Better housing and sanitary conditions are also slow in coming.

¹²In summer 1965, 8 Indians acted as fishing guides at Great Bear Lake. Before their two-month contract was finished 4 had returned home.

¹³Pers. comm., W. Habrich, Jan. 1965.

¹⁴In 1965 it was estimated that a conscientious, single fisherman could earn \$1,000 per season!

¹⁵Indian Affairs Branch, Fort Smith, N. W. T.

¹⁶N. W. T. Today, op. cit., p. 55.

TABLE V - TOTAL INDIAN INCOME, HAY RIVER, 1963

Source	\$
Treaty	1,065
Family allowance	4,081
Welfare assistance	4,514
Fishing/forestry	3,000
Trapping	6,000
Skilled work	2,000
Other casual	16,200
Total:	36,860

Source: Indian Affairs Branch, Fort Smith, N. W. T.

Land Use

Actual land use in the settlement can be seen from Figures 10 and 15. This, however, is at considerable variance with the theoretical pattern established after the flood of 1963 (see later section pp. 125-133). All of Vale Island has been zoned for industrial use, and, whilst present residential uses are permitted, there is to be no further residential building on the island. The new subdivision located on the mainland is to be developed under planned zoning for specific use to prevent the recurrence of the haphazard development seen on Vale Island.

Figure 10 represents the position on Vale Island, the culmination of the sporadic development during the fifties. Commercial and industrial use has focussed around Mackenzie Drive but is really

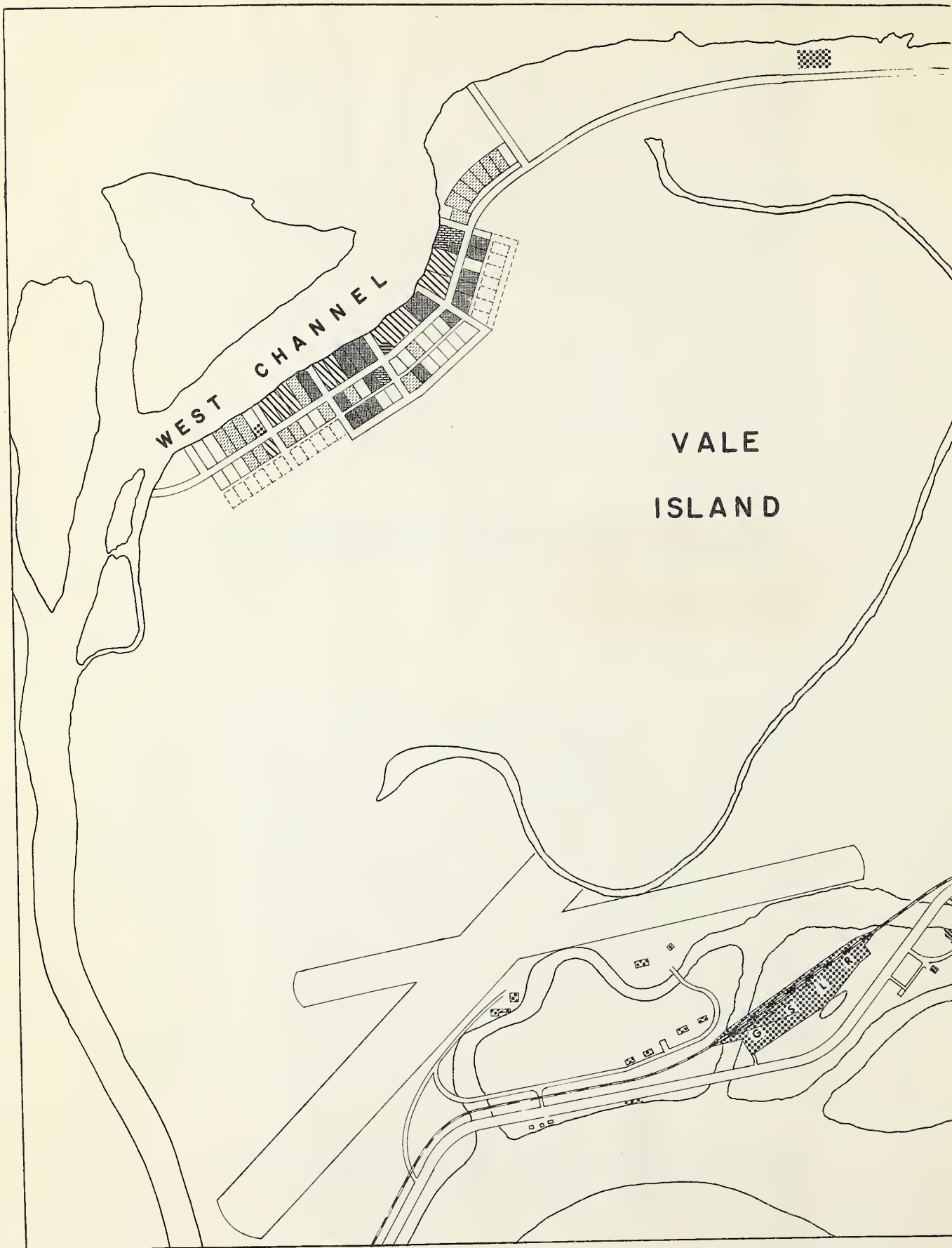


11. Mackenzie Drive, the focus of commercial activity in Hay River in 1965. The buildings nearing completion on the right are N. T. C. L. warehouses. Looking North



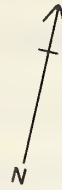
12. Mackenzie Drive looking in the opposite direction to Plate 11. The unpaved streets create a considerable dust problem during the summer.

...and the ...



LAND USE, HAY RIVER 1965

400 0 400 800 1200 Feet



D.P.W.
DREDGE
SITE

INDIAN
VILLAGE

WATERFRONT

DOCKYARD

Mackenzie
Drive

HAY RIVER

Surveyed but not improved

Railway House Shack/Cabin

s Federal school T Truck company

Industry Divisions

/// Fishing	■ Retail
■ Government Fishery Dept.	Public utilities
■ Transportation & Communication	Service
{} Construction	■ Government Service
≡ Wholesale	■ Recreation

Source: Field survey, 1965

Figure 10

no more than a disorganized line of government offices, transportation companies and retail stores, further emphasized as the main industrial axis of the town by the location there of the railway in 1964. The West Channel emerges clearly as the fishing centre where the majority of fishermen and their families live; this seems unlikely to change.

Behind the industrial-commercial axis lies the main residential zone, laid out at a time when planning was thought neither essential nor even necessary. Thus again there is haphazard development still today; residences are scattered over a considerable area and frequently separated by unused land. This is partially a result of people moving houses to the new subdivision, but is an inherent problem of the fact that a gridiron layout takes no account of poor land, often unusable. Thus compact, orderly development, now considered essential in the north, is strikingly absent on Vale Island.

In view of the state of transition through which Hay River is passing, a detailed land use analysis would probably be meaningless. However, the striking feature that does emerge is the existence and probable permanence of four separate centres by 1964. This brings with it problems of servicing, road maintenance, journey to work and administration, which are out of all proportion for a small town of two thousand people.

Housing and Building

Previous to the development of the new subdivision it is true to say that the standard of housing and building in Hay River was generally low. Low incomes and high building costs generally

precluded the building of good quality private homes. There has not been, in Hay River, one dominant company to provide good housing for employees. Moreover, lack of services, sewerage and piped water coupled with the annual possibility of flooding led to an attitude of "making do" in many cases. Most of the better housing was occupied by government officials and representatives of major companies. However, with the development of the new subdivision this is changing and Table VI reveals that properly constructed houses are the rule here.

TABLE VI - HOUSING BY AREA AND TYPE, HAY RIVER, 1965

Area	Cabins/Shacks	Houses*	Trailers	Apts/ Duplex
Indian Village	39	2	--	--
Vale Island: W. Channel	19	17	--	--
Townsite	66	88	3	2
New Subdivision	8	77	10	5

Source: Field Survey, June 1965.

*More than two rooms.

Some idea of commercial building can be gained from Appendix III where value by industrial division is given. On the whole in 1965 the better buildings belonged to the government or transportation companies.¹⁷ These buildings generally use piling techniques or

¹⁷Particularly C.N.T. who also own 20 of the better houses in the new subdivision.

concrete foundations. Private companies tend to have less substantial buildings; this is particularly true of fishing companies. With progress in the new subdivision and the beginning of the commercial centre, better and more substantial building seems to be the aim for companies that will locate there.

TABLE VII - HOUSING BY TYPE, HAY RIVER, 1965

Type	Number	Per Cent
Shacks and cabins	132	39.8
Trailers	13	3.2
Houses	184	55
Duplex and apartments	7	2
Total:	334	100.0

Source: Field Survey, June, 1965.

Information on state of housing is intended to give only a general picture, but it is immediately apparent that the percentage of poor housing is high as is the percentage of lower value residences. It is interesting to note that there has been little change since 1961 when dwellings of less than two rooms made up 40 per cent of the total.¹⁸ Thus the overall picture remains the same (Table VII); only location has changed. It does, however, seem likely that the

¹⁸ Census of Canada, 1961.



13. Typical housing along Mackenzie Drive on the way to the West Channel.



14. Part of the West Channel fishing village showing residences, storage sheds and a converted "caboose" in the foreground.

percentage of cabins and shacks will decrease as new building takes place in the new subdivision. However, whilst Hay River appears to be improving housing standards Table VIII shows that it is still far behind the national figure.

TABLE VIII - COMPARATIVE STANDARDS OF HOUSING, 1961

Area	Per Cent Residences 2 or less rooms	Per Cent less than \$7,000 value of owner-occupied residences
Canada	4.5	30
N. W. T. & Yukon	37.0	85
Hay River	39.8	92
Fort Smith	22.0	88

Source: Census of Canada, 1961.

In terms of length of occupancy the town shows quite the reverse to the Canadian picture, though not as extreme as Fort Smith in this regard. This reflects the great degree of mobility in the community.

Social Conditions

In "New Industrial Towns on Canada's Resource Frontier," the ideas of "push and pull migration" are put forward in relation to northern communities.¹⁹ Hay River fits well into this analysis;

¹⁹I. M. Robinson, New Industrial Towns on Canada's Resource Frontier, Research Paper No. 73, Dept. of Geography, University of Chicago, Chicago, 1962, 190 pp.

TABLE IX - CONTINUOUS OCCUPANCY BY HEAD OF HOUSEHOLD,
CANADA, HAY RIVER, FORT SMITH, 1961

	less than 1 yr	Per Cent	1 - 2 yrs	Per Cent	3 - 5 yrs	Per Cent	6 - 10 yrs	Per Cent	10 + yrs	Per Cent
Canada	698,134	15	763,175	17	906,805	19	757,227	16	1,429,152	31
Hay River	105	34	54	17	61	19	55	17	35	11
Fort Smith	123	36	97	28	72	21	22	6	28	8

Source: Census of Canada, 1961.

many present residents were attracted north by the prospect of "making good," particularly by the commercial fishing; many of the present male labour force were formerly fishermen. However in most cases there was some element of disappointment, but people have remained, awaiting the economic expansion of the town, particularly that thought to be associated with the coming of the railway. Many of these and more recent migrants would confess that in Hay River they are able to escape "the hampering mores of established centres,"²⁰ and that they feel a general attitude of freedom and ability to make one's own way in the town. However, with the growth of the town and its importance and the complexity of economic structure, this too is disappearing as Hay River loses its frontier nature and gradually more skilled and professional people move in from the south.

²⁰I. M. Robinson, op. cit., p. 54.

The visitor to Hay River is not struck by "the number and variety of recreational amenities available."²¹ In fact the town seems rather less well supplied than most in the north, particularly than Yellowknife. In the summer great use is made of natural facilities for recreation, especially fishing, swimming and water-skiing. Apart from this the town offers one theatre and several clubs and organisations. In general there seems greater concern with economic development and growth than provision of recreational facilities. However, again much of this may change with the establishment of the new subdivision, as already facilities for skating and curling have been constructed.

Flooding Problem

The abnormally serious flooding of spring 1963 was in many ways a turning point in the town's recent development, so much so that in summer 1965 the community was still in a state of transition. This, coupled with the fact that it is still growing rapidly, makes it difficult to generalize at this stage.

As previously mentioned the community, situated on a low lying deltaic island, is particularly susceptible to flooding. The heavy winter snowfall of 1962-3 and an ice jam on the Hay River prevented normal break up; thus instead of slight flooding along the island peripheries before melt waters finally break into the lake, much of Vale Island was covered by three to five feet of water and

²¹Ibid., p. 60.

large ice blocks were carried into the town. Even old Hay River, normally above the level of flooding, was inundated; only the West Channel escaped.²² The zone of extensive damage (Figure 5) coincides with the 1948-50 part of Vale Island townsite and is also the area most prone to flooding each spring.

Just before the flood, the year 1962 had proved one of the best in the town's development since the war. There was great anticipation of the proposed railway coming to Hay River; 50 feet by 500 feet lots on Mackenzie Drive had risen in price from \$4,000 to \$10,000 since 1961;²³ over \$900,000 of construction had been initiated or completed during 1962, and 80 new lots opened up. Flood damage was estimated between one million and eight hundred thousand dollars;²⁴ houses and buildings were torn up and moved several lots away, many were damaged by ice-blocks. Many individuals lost businesses and equipment set up over ten years.

That it was not a more severe set back to the community is due to several factors. It was announced shortly after the flood that the railway would still terminate in Hay River, thus the potential for accelerated development remained and a sense of optimism prevailed. The Territories and Federal Government paid almost total damage compensation.²⁵ Many enterprises in the town benefitted from the

²²In the 1951 floods only the West Channel was flooded.

²³Edmonton Journal, 1st April - 3rd May, 1963.

²⁴Loc. cit.

²⁵Sessional Paper No. 9, Votes and Proceedings, Northwest Territories Council, 26th Session, Nov. 18 - 20, 1963, Ottawa.

clearing up and restocking activities; thus retail outlets, particularly food stores and hardware stores enjoyed a minor boom, and re-erection and house moving gave opportunities for a good deal of work.²⁶ Also the town benefitted from the publicity it gained during the flood; both Canada and Ottawa were made more aware of the town and its many problems and also of its growing importance in the Northwest Territories. Thus from 1963 it seems that a new phase opens in Hay River's development.

The seriousness of the flood and the fact that Hay River was an important link in the transportation net of the north, likely to become more important, meant that serious consideration was finally given to the flooding problem. Only two methods of complete protection were available; first, a dam at Hay Lake to control the flow in early spring, this would prove costly, one million dollars, and involve considerations of water balance in Alberta as well; second, river diversion at a cost of over two million dollars. Methods of partial protection involved partial diversion, dyking the town costing \$160,000, and completing the west channel road bridge on the Mackenzie Highway.²⁷

Except for completing the bridge over the West Channel none of these has been carried out. A decision was taken to relocate the

²⁶Area Administrator's Report, Hay River, Sept. 1965.

²⁷Before completion of the bridge in 1964, Vale Island was connected to the mainland by a fill in the West Channel. This tended to concentrate flow down the East, or Main Channel.

town,²⁸ at least the residential, and if possible, the commercial sectors. Initial considerations of consolidating development in a relatively compact community, retaining the value of existing capital investment and ease of administration, gave way to the difficulty and expense of providing flood control and the excessive cost of building on Vale Island with permafrost and poorly consolidated surface material.²⁹ Thus the new subdivision was located at Mile 2 on the east side of the Mackenzie Highway, at a site known to be free from flooding and which test borings indicated to be free of permafrost. The intention was to remove the residential areas from the zone of potential flooding, (see pp. 125-127).

It was quickly realised that industrial activity would remain on the island, particularly fishing and shipping facilities. In 1965 all the major commercial and industrial enterprises were still located on Vale Island and there was a general reluctance to move away from the economic axis of Mackenzie Drive. Apart from continuing to blast the annual ice-jams and establishing emergency procedure, no flood protection measures have been taken. Recently the Public Works Department indicated plans for partial protection, dyking across islands D and C and possibly B (Figure 5), to channel the waters, which might have more force to break the ice-jam, and protect the

²⁸Sessional Paper No. 1, Votes and Proceedings, Northwest Territories Council, 25th Session, May 3 - 5, 1963, Hay River, N. W. T.

²⁹Habitat, "Hay River," July - August, 1963, pp. 18 - 21.

town from ice-block damage.³⁰ It is hard to see that this would not create conditions similar to the old West Channel fill. In general, with the air of optimism prevailing in 1965, the flood problem had moved to the back of people's minds.

Conclusion

In December 1964 the Great Slave Lake railway, costing eighty-four million dollars arrived. Although not yet fully operational it crystallised the hopes for Hay River's economic development among the residents, and has provided a base for expansion.

"It is a frontier town, a lazy, boozing, disorganized place ... but it is growing up," is the manner in which Hill described the town in March 1964;³¹ this seems fair comment. In many aspects the town is poorly developed, it has a poorly paid, largely unskilled labour force, it has a severe Indian problem, the standard of building is poor and it is still vulnerable to a crippling flood. However, from the various analyses it does seem that Hay River is no longer a frontier town and in certain respects is further ahead than either Yellowknife or Fort Smith. This is particularly true now that the new subdivision is under way and a more conscious, planned effort is being undertaken to ensure that Hay River will have the amenities and features of any small southern town, as well as the specific requirements for northern living and northern development.

³⁰ Tapwe, Hay River, Oct. 7, 1965.

³¹ Edmonton Journal, 12th March, 1964.

CHAPTER IV

ECONOMIC STRUCTURE

Although it is quite clear that Hay River is primarily concerned with transportation and fishing, other economic activity exists in the town, as indicated in an analysis of functions within the town. Economic activity in towns is generally divided into two sections which may be called town-forming and town-serving activities. Thus besides reviewing employment structure and trends within Hay River the degree to which various sectors of the economy are the *raison d'etre* of the town will be examined.

As a town situated on the periphery of continuous settlement there are several features which, if they could be quantified in any meaningful way, might alter the picture presented below. Such are; the amount of secondary and supplementary employment, the mobility of a poorly paid, largely unskilled labour force and the effect of transient labour. Also the lack of nearby large urban centres makes Hay River, with just less than two thousand inhabitants, perform functions unusual for a town of that size.

The business survey carried out in the summer of 1965 provided a great deal of detailed information.¹ This enabled the

¹There are just under sixty enterprises in Hay River and it was possible to gain information by personal interview from fifty-five.

presentation of a wide variety of methods of analysing urban areas, which in turn enables a closer economic analysis of the town and incidentally provides a limited means of assessing each method as applied to the same situation.

Employment Structure and Changes

Employment structure provides the simplest, and possibly crudest, measure of the economic base of a town. Unfortunately information previous to 1961 was not available; thus only a five-year period is available for a discussion of changes and trends.

Because of the large numbers of children (see Chapter III) the percentage of employed people in the total population is small, 31 per cent. In Yellowknife in 1962, although decreasing, it was 41 per cent;² in Fort Smith 37 per cent.³ This proportion seems fairly constant in Hay River since between 1961 and 1965 it rose by only 0.3 per cent.

The most striking feature in Table X is the dominance, in 1965, of fishing, service, and transportation and communication industries. Fishing and transport⁴ when taken together total about 50 per cent of the entire labour force which is similar to the 1962 position of mining in Yellowknife. After transport the fourth most important industry is retail.

²L. S. Bourne, Yellowknife, N. W. T. A Study of its Urban and Regional Economy, Northern Coordination and Research Centre, Dept. of Northern Affairs and National Resources, Ottawa, 1963, p. 53.

³Census of Canada, 1961.

⁴Unless otherwise indicated, transport is used in Chapter IV to mean the transportation and communication industry.

TABLE X - EMPLOYMENT BY INDUSTRIAL DIVISIONS,
HAY RIVER, * 1961 - 1965

Industry	1961		1965		Change		Payroll 1965	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	\$'000	Per Cent
Agri- culture	3	0.9	4	0.6	+ 1	+ 33	--	--
Trapping)	69	16.3	13	2.1	+120	+200	24	1.2
Fishing)			176	28.6			212	11.5
Construction	59	14.2	39	6.3	- 20	- 32	151	8.2
Manu- facturing	16	3.8	3	0.4	- 13	- 81	13	0.6
Transport and Communi- cations	105	25.0	129	20.9	+ 24	+ 22	560	30.2
Public Utilities	9	2.3	13	2.2	+ 4	+ 48	69	3.8
Wholesale	7	1.8	9	1.4	+ 2	+ 35	42	2.4
Retail	34	8.2	56	9.2	+ 22	+ 67	185	10.1
Finance, In- surance and Real Estate	3	0.9	12	1.9	+ 9	+300	50	2.7
Service	110	25.6	165	26.7	+ 55	+ 50	556	30.4
(Community)	(31)	(7.2)	(57)	(9.3)	(+ 26)	(+ 83)	(171)	(9.2)
(Personal)	(43)	(9.4)	(61)	(9.9)	(+ 18)	(+ 41)	(164)	(8.9)
(Govern- ment)	(33)	(8.0)	(42)	(6.7)	(+ 9)	(+ 27)	(207)	(11.2)
(Recreation)	(3)	(0.9)	(5)	(0.8)	(+ 2)	(+ 66)	(14)	(0.8)
Not Stated	6	1.3	--	--	--	--	--	--
Totals:	421	100.0	619	100.0			1,862	100.0

1961 - Total population 1371; per cent of labour force 30.7.

1965 - Total population 1991; per cent of labour force 31.0.

Sources: 1961 Statistics from A. J. Lay, Census Division,
Dominion Bureau of Statistics, Ottawa, July 1965.

1965 Statistics from field survey, Hay River, June-
July 1965.

*Dominion Bureau of Statistics, Standard Industrial Classifica-
tion Manual, Ottawa, 1960.

THE JOURNAL OF THE

DATE	NAME	AMOUNT	REMARKS
1870			
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All industries except construction and manufacturing showed a tendency to rise in numbers employed between 1961 and 1965. The marked decline in construction is largely due to the nature of the industry; wide fluctuations were noted by the employers, depending on the season and contracts available. In 1961 there was considerable construction activity; 1965, however, was particularly slack, awaiting further development of the new subdivision. The decline of manufacturing is due to the closing of several manufacturing businesses.

The great apparent rise in fishing is similar in nature. Of all industries in the town fishing probably shows the greatest mobility of labour; a poor year generally means a decline in numbers in the following year. The period 1959 to 1961 was relatively poor, hence the low figure for fishing employment. 1964 on the other hand was quite good, hence the expansion of employment in 1965. This fact must be borne in mind in considering the part that fishing plays in the community; it may not always occupy the exalted position of 1965.

Despite a rise in absolute numbers, the percentage of people employed in transportation has declined. This is due to the greater percentage increase in nearly every other industry and also to the fact that Northern Transportation Company Ltd. makes a practice of not employing local residents permanently.⁵

Both retail and community service industry showed considerable expansion during the period. Retail expansion was a result of the

⁵Yellowknife Transportation Company Ltd. which sold out to N. T. C. L. in winter 1965, employed up to 10 local residents. N. T. C. L. in 1965 - 1966 employed only one permanently.

general growth of the town, and community services owes the increase to the opening of the Health Centre, the W. W. Williams Hospital and the expansion of the Federal School. This was probably the most significant development, since service and retail activities combined grew from 29 per cent in 1961 to 34 per cent of total employment in 1965. Because of fluctuations other patterns, particularly overall, are difficult to detect.

Total service industries, although showing a smaller percentage than in Yellowknife (30 per cent), increased by about 50 per cent which is slightly greater than the Yellowknife figure of 48 per cent.⁶ Hay River, however, does not show as marked an emphasis on government service as does Yellowknife.

As a balance to the above, payroll statistics are presented. Whilst it is dangerous to consider high income an indication of a high degree of community support,⁷ payroll analysis is quite revealing. The overall dominance of transportation with 30 per cent of total payroll is clear (C. N. T. alone makes up 9 per cent of the total). Fishing, including government employees associated with the industry, made up only 11 per cent of the total. Government service also makes up about 11 per cent. Thus the importance of the government payroll in the town is clear. If all government employees are considered, regardless of occupation, the payroll rises to \$450,000, some 24 per cent of the total.

⁶L. S. Bourne, op. cit., p. 53.

⁷In Hay River the higher the income, the greater the tendency to concentrate shopping in the annual trip "outside," and also to use direct delivery from Edmonton.

The above gives some measure of the sources of personal income. It is clear that since Hay River is not dominated by a single industry income is spread much more evenly through the various activities than was the case in Yellowknife in 1962.

Population Supported by Various Activities

One measure of the significance of an activity in industry is the number of people receiving direct support from it; this may be seen from Table XI. Since government departments are a major employer in northern communities, an attempt was made to find out how many people were dependent on government employment. Thus in Table XI (a) all government employees, whether working in other industries or not, were considered. This does, however, exclude labourers who might be employed seasonally on government projects; thus the percentage of government support might be higher.

In both Table XI (a) and XI (b) fishing seems to be supporting most people, but this must be qualified by the uncertain nature of the industry and the fact that it is not clear how many of those supported would also be dependent on fishing in both winter and summer seasons.

Less likely to change is the percentage supported by government employees, some 15 per cent, which rises to 16 per cent if Crown Corporations are included.⁸ By number of people, transport falls considerably behind government and fishing. One important aspect is the

⁸ Canadian National Telecommunications, Canadian National Railway and Northern Transportation Co. Ltd.

TABLE XI - POPULATION SUPPORTED BY TYPES OF
ECONOMIC ACTIVITY, HAY RIVER, 1965**

(a) <u>By sectors of employment</u>			(b) <u>By industrial divisions</u>		
Sector	No.	Per Cent	Industry	No.	Per Cent
Fishing	429	21	Fishing	464	23
Government*	312	15	Service	417	21
Transport and Communica- tion	251	13	(Government)	(122)	(6)
Service	198	10	Transport and Communica- tion	307	15
Retail	137	7	Retail	139	7
Construction	111	6	Construction	111	6
Other Industry	197	10	Other Industry	197	10
Indians and Marginals	356	18	Indians and Marginals	356	18
Total:	1991	100.	Total:	1991	100.

**Estimated by applying 31 per cent of population in labour force and married/single ratio.

*All Government employees regardless of industry.

number of marginals and unemployed persons, constituting about 8 per cent of the total, between thirty and forty adults.

When examined by industrial division the significance of service industry again comes to the fore, only 2 per cent less than fishing.

It is again significant that unlike Yellowknife both tables reveal a fairly widely based support of the total population, indicating that in this

Journal of Management Studies, 19(1), 67-80.

respect Hay River is more soundly based than is the largest town in the Northwest Territories.

Enterprises Supported by Various Sectors of the Economy

In addition to examining the support of the population it is necessary to consider what it is that provides the maintenance of retail stores, garages, truck companies and the service industries. It was not thought realistic to assess this directly from the percentage of total employment, as this takes no account of diversity of income, spending power and possible spending outside the community by various groups. Information was obtained from each concern for total gross income and the percentage breakdown of its source. To gain a more realistic picture only private concerns are included (Table XII); Crown Corporations, the liquor store and government departments are excluded. It was impossible to get any breakdown at all from most personal service enterprises such as cafes, barber shops, etc., so these too had to be excluded.

Clearly, the major dependence was on the category of "others", in most cases the general public. It seemed unlikely that the greatest contribution here came from fishermen but was probably made up largely by service and transport employees and their families.

Beyond this, however, government agencies proved to be the major contributor to the total gross income accruing to Hay River enterprises. Transport proved to contribute very little, which reveals the fact that most companies use facilities further south, either in Peace River or Edmonton. The importance of carrying fish south is revealed in the fact that 27 per cent of gross income to transportation companies (private)

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TABLE XII - BREAKDOWN OF GROSS INCOME TO
ENTERPRISES, HAY RIVER, 1965

Industry	Gross Income \$000	Govern- ment Per Cent	Fish- ing Per Cent	Trans- port Per Cent	Con- struction Per Cent	Others Per Cent
Construction and Contracting	450	54	--	--	30	16
Transport*	800	13	27	19	4	40**
Retail	1, 848	19	20	2	16	43
Wholesale	2, 100	21	12	7	8	47*
Finance, Insurance and Real Estate**	25	10	8	4	10	68
Hotels & Motels	548	20	--	43	10	27
All Enterprises	5, 781	17	13	7	11	50

Source: Field Survey, June/July, 1965.

*Excludes C. N. T., N. T. C. L., and C. N. R.

**Half of this is with retail stores.

*Heating, fuel and power plant.

**Excludes the Bank.

came from the fishing companies. A further 20 per cent of transport income came from retail stores in the town.

Thus there is no overall dependence on any of the sectors of the economy which have figured highly in previous tables. This survey, in fact, revealed convincingly that, as the economy becomes more diversified, support to enterprises which are essentially non-productive,

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CONTENTS					
ARTICLES	REVIEWS	NOTES	OBITUARY	MEMOIRS	GENERAL
1-10	11-20	21-30	31-40	41-50	51-60
61-70	71-80	81-90	91-100	101-110	111-120
121-130	131-140	141-150	151-160	161-170	171-180
181-190	191-200	201-210	211-220	221-230	231-240
241-250	251-260	261-270	271-280	281-290	291-300
301-310	311-320	321-330	331-340	341-350	351-360
361-370	371-380	381-390	391-400	401-410	411-420
421-430	431-440	441-450	451-460	461-470	471-480
481-490	491-500	501-510	511-520	521-530	531-540
541-550	551-560	561-570	571-580	581-590	591-600

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becomes increasingly complex.

Taxation Base

As Bourne pointed out, subsidization of northern communities by government,⁹ both territorial and federal, is fundamental to the existence of the communities and without grants and subsidies municipal costs could hardly be defrayed. This is something not revealed in employment statistics and a factor that means government importance is much higher than previously indicated. In general it seems that government monies provide for half or more of community budgets. Lack of private investment¹⁰ and the high cost of building in the north generally mean that expansion in services provided, whether road, sewerage or public building, is wholly or partially paid for by government grant or loan. In the case of Hay River such government support is given further emphasis when flood compensation payments are considered; thus the total cost of flood damage in 1963 was borne by the government.

In Hay River roughly half the town's revenue is in the form of government money, but it has been well below this. Yellowknife in recent years has had more than half the budget in government grants (1964, 53 per cent), Fort Smith gets some 87 per cent from the government.¹¹

⁹L. S. Bourne, op. cit., p. 63.

¹⁰W. S. Kirkpatrick, "Challenges and Opportunities in Developing Canada's Northland," Western Miner and Oil Rev., Feb. 1961, pp. 28 - 33.

¹¹Canada, Dept. of Northern Affairs and National Resources, N. W. T. Today; A Reference Paper for the Advisory Committee on the Development of Government in the Northwest Territories, Ottawa, 1965, p. 135.

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TABLE XIII - ANNUAL REVENUE, HAY RIVER, 1957 - 1964
(Income to Municipality)

Year	Government Grant		Local Taxation*	
	\$	Per Cent	\$	Per Cent
1957	14,892	50	14,702	50
1959	19,387	46	22,983	54
1960	21,475	45	25,795	55
1961	29,665	44	37,606	56
1962	35,486	43	46,545	57
1963	74,427	58	52,341	42
1964	87,232	55	72,125	45

Source: Yearly audit, Municipal Office, Hay River.

*Includes all forms of licences and taxation.

This may reflect a greater concern on the part of the government to provide services and amenities in the larger centre of Yellowknife; up to 1963 not only was Hay River frequently given second place, but also the level of development there did not warrant heavy government spending.

Up to 1963 the percentage of government grants in the town's revenue was gradually decreasing (Table XIII). After the flood the government percentage leapt from 43 per cent to 58 per cent and has since remained more than half. However, this is the picture presented by the annual audit; in reality it is much different. The difficulties of tax collection in Hay River, coupled with delay in arrival of government funds meant that in 1962 out of a total income received of \$102,440, 28

per cent was in the form of taxation and 72 per cent in the form of government grants.

TABLE XIV - LOCAL REVENUE BY SOURCE, HAY RIVER, 1964
(To Municipality)

Source	\$	Per Cent
Government Grants	87,232	55
Taxation:		
Territorial	11,308	7
Wholesale	7,270	5
Transportation and Communication	6,929	4
(C. N. T.)	(3,726)	(2.3)
Fishing Companies	3,968	2.5
Others	42,650	27
Total:	159,357	100.0

Source: Hay River Municipal Office, taxation file.

An attempt was made (Table XIV) to find out whether any major industry was contributing significantly to the town's revenue. This proved not to be the case, and, surprisingly, wholesale (consisting of the four bulk oil plants) contributed most, although only 5 per cent. Fishing is noticeable by the very small contribution made, only just greater than C. N. T.

Other taxation, from householders, small enterprises and licences made up the greatest percentage after government. If this may be taken as an indication of the base of the town, then together,

government, fishing and transport make up 61 per cent.

Basic - Non-basic Method

As a way of distinguishing between activities which serve an urban area and those which make it grow, the various forms of basic, non-basic analysis have been widely used in Canada and the U. S. A. Much has been written about the value of applying these methods; it is not the intention to review this here.¹² In applying these in the North problems of distance, isolation, lack of large centres and "moonlighting," curtail the effectiveness of the method. However, if too much detail is avoided, the basic, non-basic method provides a general picture of the economic base.

The minimum requirements approach proved to be quite useful in indicating where the basic employment lay. Basic employment is that in excess of the lowest possible percentage employment in each industrial division, found in a viable Canadian town of 1991 persons.¹³ Thus, according to this, fishing, transport and service industries made up more than 78 per cent of basic activity. By the standard deviation worked out for cities of over 10,000 (more than four standard deviations from the average was Class I, and one standard deviation Class III), fishing, transportation, personal services and recreation all showed Class I deviations. Financial activities, manufacturing and wholesale were all below the average.

¹² H. M. Mayer and C. F. Kohn, Readings in Urban Geography, Chicago, 1963, pp. 85 - 116.

¹³ J. W. Maxwell, "Functional Structure of Canadian Cities: A Classification of Cities," Geogr. Bull. vol. 7, No. 2, 1965, pp. 79-104. Using formula $\text{Log } y = a + bx$, where y = population, x = expected minimum requirements; intercept (a) and slope (b) are given for each industrial division. It was possible to calculate the lowest amount for a town the size of Hay River.

TABLE XV - BASIC EMPLOYMENT, HAY RIVER, 1965

Industry	Minimum Requirements			Sales Conversion			
	Mini- mum Per Cent	Per Cent in Excess	Per Cent of Excess	S. D.*	Employment No. Basic	Payroll Basic \$'000	Per Cent
Agriculture	---	0.6	0.7		1	---	---
Trapping	---	2.1	2.4		13	24	3.2
Fishing	---	28.6	32.6	I	156	212	28.5
Construction	0.1	6.2	6.9	II	1	5	0.7
Manufacturing	0.02	0.3	0.5	B**	---	---	---
Transport and Communication	1.0	19.9	22.7	I	87	300	40.4
Public Utilities	0.3	1.9	2.0	II	---	---	---
Wholesale	0.6	0.8	1.0	B	3	14	1.8
Retail	2.5	6.7	7.4	III	6	20	2.6
Finance, Insurance and Real Estate	1.0	0.9	1.0	B	2	4	0.6
Service	6.9	20.2	22.4		55	163	21.0
(Community)	(3.0)	(6.3)	(7.1)	III	(3)	(12)	(1.6)
(Personal)	(3.1)	(6.8)	(7.7)	I	(20)	(52)	(7.0)
(Government)	(0.6)	(6.1)	(6.9)	III	(31)	(96)	(12.9)

THE HISTORY OF THE UNITED STATES OF AMERICA

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TABLE XV (Continued)

Industry	Minimum Requirements			Sales Conversion			
	Mini- mum Per Cent	Per Cent in Excess	Per Cent of Excess	S. D.*	Employment No. Basic Cent \$0'000	Payroll Basic Cent	Per Cent
(Recreation)	(0.2)	(0.6)	(0.7)	I	(1)	(3)	(0.4)
Total:	12.9	87.1	100.0		324	100.0	100.0
					(52.1 per cent)	(43.4 per cent)	

Source: Field Survey, June/July, 1965.

*S. D. = Standard deviation, J. W. Maxwell, op. cit., p. 87.

**B = Below average.

The total figures provided by the minimum requirements approach are misleading. They would be the same for any town of 1,991 persons. A more realistic total percentage is given by the sales conversion method, where the number of basic workers is calculated by the amount of goods or services going outside the base area. In the case of Hay River the base area is the community itself. In this analysis, fishing is clearly the major basic activity, as almost 50 per cent of the basic workers are concentrated herein. It is followed by transportation and service industry. This reveals something of Hay River's regional function, and it is interesting to note that it lies mainly in transportation, government and personal services.

The total percentage by sales conversion is 52 per cent basic, that is, 52 per cent of the total workers were either basic town-forming employees, or were regionally oriented which gives a basic, non-basic ratio of 100:92. This results largely from Hay River's small size (about half the size of Yellowknife, which had a ratio of 100:55), and its regional function in terms of resident employees is far less.

Comparisons

(a) Employment

Because of a lack of data for small towns Webb's figures for Minnesota are taken as representative of small towns in a more normally developed, southern area.¹⁴ (Table XVI). In the case of Hay River

¹⁴J. W. Webb, "Basic Concepts in the Analysis of Small Urban Centers in Minnesota," A. A. A. G., Mar. 1959, pp. 55 - 72.

the previously mentioned dominances of fishing, transport and government stand out. But more significant are the striking lackings in manufacturing, retail and wholesale, business and professional services. In community and personal services Hay River is above the Minnesota average, and so too are Fort Smith and Yellowknife. This indicates the greater degree of such services provided in northern communities; thus while people will drive (or fly) to Edmonton and Peace River for retail, wholesale and business services, it is more difficult to do this in the case of hospitals, schools and personal service. Of the three, Hay River shows a greater diversity of economic activity and a closer approximation to the Minnesota figures.

(b) Sales Conversion

Both Hay River and Yellowknife are similar in basic, non-basic structure by sales conversion. In Yellowknife Bourne found that 87 per cent of basic activity was concentrated in mining, government and transportation;¹⁵ in Hay River 84 per cent was concentrated in the three leading activities of fishing, transportation and government. Whilst Yellowknife showed no retail or service area because of the lack of developing centres nearby. Hay River, surrounded by Fort Providence, Enterprise and Pine Point, showed some developments in this area; 3.6 per cent of basic employment was in wholesale, retail, construction and financial activities. Hay River, then, differs less from normal small towns which show basic activity concentrated in trade, manufacturing and service, than does Yellowknife.

¹⁵L. S. Bourne, op. cit., p. 63.

TABLE XVI - EMPLOYMENT COMPARISONS, MINNESOTA,
HAY RIVER, FORT SMITH, YELLOWKNIFE

Industry	Minnesota Per Cent	Hay River Per Cent	Fort Smith Per Cent	Yellowknife Per Cent
Agriculture and Forestry	3.3	0.9	4.6	1.9
Mining	3.4	--	--	46.7
Fishing	--	16.3	--	--
Manufacturing and Construction	22.5	18.1	7.8	4.9
Transport and Communication*	10.6	27.0	13.6	8.8
Retail and Wholesale	28.1	10.0	6.0	6.9
Finance, Insurance and Real Estate	2.7	0.9	0.4	1.4
Service	29.3	25.6	67.2	27.8
(Public Admini- stration+)	(4.8)	(15.3)	(52.9)	(17.8)
(Business and Professional)	(18.2)	(0.9)	(5.4)	(1.8)
(Personal)	(6.3)	(9.4)	(9.2)	(8.2)
Not Stated	--	1.3	0.4	1.5
Total:	100.0	100.0	100.0	100.0

Sources: Minnesota, J. W. Webb, 1959.
Hay River, Census of Canada, 1961.
Fort Smith, Census of Canada, 1961.
Yellowknife, Census of Canada, 1961.

*Includes public utilities.

+Includes community service.

TABLE XVII - COMPARISON OF BASIC ACTIVITY, HAY RIVER, FORT SMITH AND YELLOWKNIFE, 1961

Industry	Hay River			Fort Smith			Yellowknife		
	Mini- mum*	Per Cent in Excess	Per Cent of Excess	Mini- mum*	Per Cent in Excess	Per Cent of Excess	Mini- mum*	Per Cent in Excess	Per Cent of Excess
	Per Cent	Excess	Excess	Per Cent	Excess	Excess	Per Cent	Excess	Excess
Agriculture	--	0.7	0.7	--	3.4	4.0	--	0.7	0.8
Trapping) Fishing)	--	16.2	18.3	--	0.6	0.8	--	1.8	2.2
Mining	--	--	--	--	--	--	--	46.4	55.9
Construction	0.1	14.1	16.0	0.1	3.3	3.8	0.2	3.5	4.3
Manufacturing, Transport and Communication	0.7	24.3	27.5	1.0	10.4	11.9	1.4	6.8	8.3
Public Utilities	0.2	2.1	2.3	0.3	2.4	2.8	0.3	0.3	0.4
Wholesale	0.5	1.1	1.2	0.6	--	--	0.7	--	--
Retail	1.9	6.3	7.1	2.5	2.7	3.4	3.3	3.6	4.4
Finance, Insurance and Real Estate	0.9	--	--	1.0	--	--	1.1	0.3	0.3
Service	6.3	19.6	22.2	6.9	60.8	69.0	7.8	18.9	22.7
(Community)	(2.7)	(4.7)	(5.3)	(3.0)	(14.1)	(16.4)	(3.3)	(5.5)	(6.6)
(Personal)	(2.9)	(6.5)	(7.3)	(3.1)	(6.1)	(6.9)	(3.3)	(4.3)	(5.2)
(Government)	(0.5)	(7.5)	(8.5)	(0.6)	(34.8)	(39.9)	(0.8)	(7.8)	(9.4)
(Other Services)	(0.2)	(0.7)	(0.7)	(0.2)	(5.7)	(5.9)	(0.3)	(1.3)	(1.5)
Total:	10.6	88.1	100.0	12.4	87.2	100.0	15.6	82.9	100.0

Source: Census of Canada, 1961.

*Minimum per cent based on J. A. Maxwell

(c) Minimum Requirements

Table XVII provides a measure of comparison in basic activity among Hay River, Fort Smith and Yellowknife, the three major communities in the Great Slave Lake area. The completely different nature of Fort Smith is at once apparent, with the overwhelming concentration in government and administration with a very secondary emphasis on transport.¹⁶ Hay River and Yellowknife are essentially similar, with concentration in their respective extractive industry, transport, and services.¹⁷

Perhaps the most significant feature to emerge is that Hay River shows a much greater degree of basic activity in retail, wholesale, finance, manufacturing and construction than the other two. Bearing in mind the shortcomings of the statistics, Hay River had 28 per cent of basic activity in this sector, Fort Smith 11.6 per cent and Yellowknife 9.4 per cent. There was little reason to believe that the relative position had changed significantly in 1965.

(d) Floor Space

This method of analysis, although not revealing when applied to one town alone, as different activities by necessity require varying amounts of working space, allows comparisons to be made.¹⁸ The total

¹⁶ With the completion of G. S. L. R. in 1964, most of this function has since disappeared.

¹⁷ See above for discussion of the number engaged in the Hay River fishery in 1961.

¹⁸ C. M. L. A. Hutton, Functional Differentiation among Small Towns, unpub. M.A. Thesis, Dept. of Geography, University of Alberta, Edmonton, 1965, 157 pp.

amount of floor space used by any one industry is obtained and an index calculated per hundred inhabitants. Table XVIII compares Hay River with small towns around Edmonton chosen by Hutton; the breakdown for Hay River alone is given in Appendix III.

This tends to confirm more clearly, as the towns were similar in size, that Hay River is generally deficient in trade, financial and the overall service industries and, quite surprisingly, in government (administration). In trade the figures were quite close and may indicate that Hay River is not so far behind in this respect, as previously observed, especially as these towns are also dependent in part on Edmonton for facilities.

Construction, fishing and transportation all proved to be well above average. The two major basic industries again coming out as the leading activities of those above the average. Construction most clearly approximated to Devon, a town similar in population.

It is interesting to note that using this analysis, one of the few that has been applied to towns of Hay River's size, Hay River shows a closer approximation to southern towns than might be expected. It could be argued that Hay River is not sufficiently far north for space requirements to be conditioned by the severe climate.

The valuation index (Appendix III) was included to put the amount of floor space into perspective. Thus, similar to the position shown by the payroll statistics, transport, service and retail emerge as the leaders. It is particularly noticeable, as a measure of impact on the town, that C. N. T. alone makes up 75 per cent of transport's total.

TABLE XVIII - COMPARISON OF FLOOR SPACE RATIOS, 1964. (Square feet per 100 persons)

	Devon	Ft. Sask.	Leduc	Morin-ville	St. Albert	Sherwood Park	Spruce Grove	Stony Plain	Average	Hay River
Population	1423	3766	2846	1000	8583	4830	596	1466	3036	1991
Agriculture	0	149	78	1892	0	0	0	153	284	0
Manufacturing	213	15053	489	940	54	18	1361	655	2348	0
Fishing	0	0	0	0	0	0	0	0	0	3073
Mines, etc.	4372	0	260	0	46	0	0	0	585	0
Construction	496	105	153	90	260	0	181	41	166	465
Transportation, etc.	939	268	690	634	186	57	538	701	502	3245
Trade	2431	2681	4037	7479	908	650	7682	9184	4381	4121
Finance, etc.	268	194	187	269	56	41	242	209	183	96
Service	8847	5768	9505	10732	5669	3421	6850	15258	8256	5177
Administration	541	5133	888	2734	267	113	393	1265	1417	1273
Total:	18107	29350	16287	24770	7446	4300	17247	27466	18122	17403

Source: C. M. L. A. Hutton

Summary

It is difficult to summarize such a wide variety of information, but certain facts may be looked upon as particularly significant. Fishing, transportation and government make up 84 per cent of Hay River's basic activities by sales conversion, which is imilar to the Yellowknife figure of 87 per cent in mining, government and transport. However, since the spread is more equal among the three activities in Hay River, the base is that much wider. By taxation base the three activities make up 61 per cent, by minimum requirements 62 per cent and by sales conversion 84 per cent; as an overall, generalized figure they probably contribute about 70 per cent to the basic employment.

Table XIX, an attempt to present a numerical index of importance in supporting the town, indicates that overall, fishing and transport contribute equally, followed by government and personal services. However, whilst the two industries generally appear most significant, it is important to remember that taken together they contribute only about 6.5 per cent of the town's annual revenue.

The importance of government support and contribution in this respect must not be under-estimated. Thus whilst not underwriting the whole cost of development, as in the Soviet North, it makes a most significant contribution.

Although government is generally about equal in its share among the service industries (which taken as a whole are perhaps second in support of the community), it is possible to total all government employees, as was done in Table XI(a). Their contribution is clearly

TABLE XIX - INDEX OF SUPPORT TO COMMUNITY BY INDUSTRY,
HAY RIVER, 1965*

Industry	Based on Tables X, XI, XIV, XV, and Appendix III	Based on Tables X, XI, XII, XIV, XV, and Appendix III
Fishing	87	141
Construction	54	84
Transport and Communication	89	142
Wholesale	53	70
Retail	71	104
Service	89	--
(Community)	--	101
(Personal)	--	115
(Government)	--	115

*The index was calculated by awarding points in each table used for amount of support to the community. Maximum points in the first column was 11, as 11 full industry groups were used, the number awarded decreasing by industry with decreasing importance. Maximum points in the second column was 14 as 14 industry groups were used to allow a breakdown of services.

important. However, many are associated with fishing and transportation and would not play a part in the town at all but for the existence of these activities. Thus these government employees are both part of and dependent on the basic industries. This is quite a different position to that in Yellowknife and Fort Smith where many more government officials perform administrative functions.

In conclusion two major facts should be considered. From the

above analysis it is evident that Hay River, particularly in basic employment, shows a greater degree of similarity to southern towns than either Fort Smith or Yellowknife and probably more than any other centre in the Northwest Territories. Second, whilst being a highly subsidized town, Hay River shows a considerable degree of economic diversification which with further development will probably increase. Not only does it have two major basic industries, but also retail, wholesale, construction and financial activities have a greater share in the economic base and community support.

CHAPTER V

FISHING AND TRANSPORTATION

As has been observed, fishing and transport form the two major bases for the town's growth and development. Both these features of Hay River have a wider importance in the Northwest Territories as a whole. Fish are one of the major renewable resource bases of the North and have given rise to a commercial venture, the fishery on Great Slave Lake. In terms of value in the Northwest Territories fish rank about equal with fur which has in recent years fluctuated between eight hundred thousand and one million dollars. Thus despite the relatively small number of persons involved, the low incomes and low level of investment the fishery is making a significant contribution to the economy of the area. In Hay River fishing is still a major element, although perhaps stagnating and even declining in importance.

As a centre of transport and communication Hay River is undoubtedly the leading community in the Northwest Territories. It is the leading port, a major road transport centre, the railhead and the centre of the Canadian National Telecommunication System. Moreover, it seems clear that its importance in this regard will continue to grow.

Fishing Industry

The nature of Great Slave Lake as a fish environment, and its

CHAPTER V

FISHING AND TRANSPORTATION

As has been observed fishing and transport form the two

principal occupations of the people of the coast.

From a fishing point of view the coast is divided into two

regions, the northern and the southern, each with its own

characteristic fish and methods of catching them.

The northern region is the more important of the two

because of the greater number of fish and the larger

number of boats which are engaged in the trade.

The southern region is the less important of the two

because of the smaller number of fish and the smaller

number of boats which are engaged in the trade.

The northern region is the more important of the two

because of the greater number of fish and the larger

number of boats which are engaged in the trade.

The southern region is the less important of the two

because of the smaller number of fish and the smaller

number of boats which are engaged in the trade.

The northern region is the more important of the two

because of the greater number of fish and the larger

number of boats which are engaged in the trade.

potential for fishing has been fully discussed by Rawson.¹ Essentially the lake is young and oligotrophic;² since the Western part receives nutrients from rivers of the sedimentary lowland areas it is a much better fish habitat than the East Arm, which receives clear, fast flowing streams from the Shield areas. The Main lake is also quite shallow; about 71 per cent is less than 150 feet deep, which is considered maximum net depth; the East Arm reaches depths of 2,000 feet.

Although there are twenty-two species of fish present in the lake,³ white fish (coregonus clupeaformis) and lake trout (cristivomer namaycush) make up 95 per cent of the marketed commercial catch. Because of slow growth rate at this latitude fish caught in the standard 5-1/2 inch gill net are generally between ten and twenty years old, in the Great Lakes they are usually between five and ten years. There is little demand for other species and only inconnu (stenodus leucicthys), northern pike (esox lucius) and pickerel (stizostedian vitreum vitreum) have been marketed.

The lake has long been fished for local purposes. With the coming of the fur trade and the beginning of settlement, domestic

¹D. S. Rawson, "The Great Slave Lake" Bull. Fisheries Research Board, Canada, Vol. 72, 1947, pp. 44-69 and "Physical Limnology of Great Slave Lake," Journ. Fisheries Research Board, Canada, Vol. 8, No. 1, 1950, pp. 1-66.

²Lacking in nutrient matter.

³Kennedy, "The First Ten Years of Commercial Fishing on Great Slave Lake," Bull. Fisheries Research Board, Canada, Vol. 107, 1956 pp. 1-50.

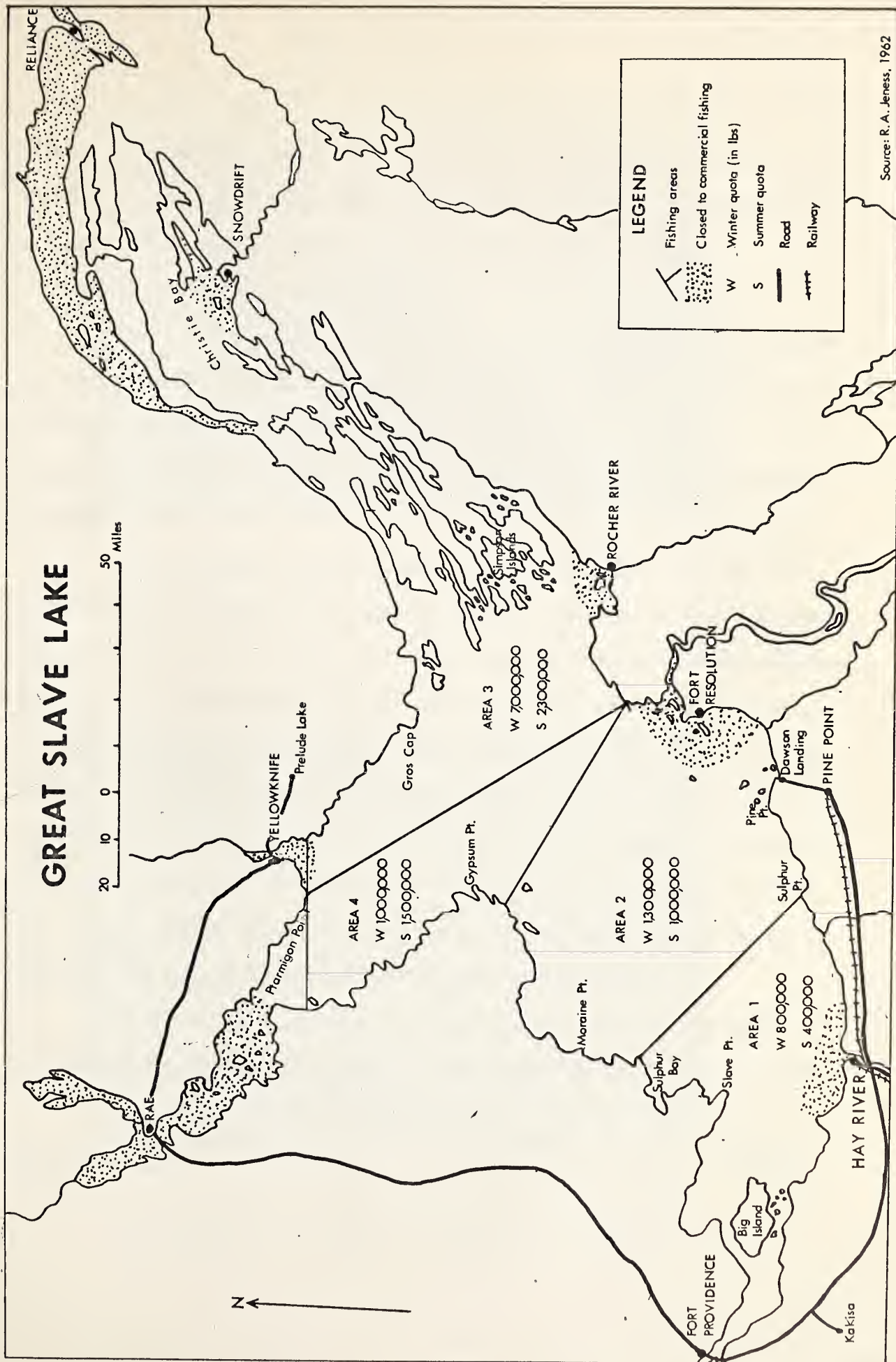


Figure II

fishing, especially to feed dogs, increased. Although as much as one million pounds may be taken around the lake each year, domestic fishing is declining; other foods are increasingly easy to obtain.

(a) Commercial Fishery

This began on July 29th 1945, after investigations had suggested an annual catch limit of 3-1/2 million Pounds. McInnes Products Ltd. moved to the lake from Lake Athabasca and set up a waterborne operation at Gros Cap. Fish were processed on barges and shipped south up the Slave River to the Waterways railhead for shipment to the U. S. A.

If the fishery was to develop to the extent that research has indicated, then provision of a suitable link to southern markets was necessary; thus this was one reason for the building of the Mackenzie Highway. As has been seen (Chapter II) this occasioned a considerable boom in the late forties and early fifties. Since then the industry has declined, and now only four companies operate, producing about 6 million pounds annually,⁴ and employing between 250 and 300 men during each season. Now that all the large fish have been taken the fishing is more difficult, for although higher prices are paid, many more fish must be caught to make up the weight which requires greater fishing effort.

In general the industry is organised in a very informal way, and in fact this makes generalization very difficult as there are almost

⁴In 1948 the quota was raised to 9 million pounds of whitefish and lake trout.



15. A two or three-man fishing boat used on the lake during the summer.



16. A packer boat towing out one of the barges used as temporary camps and fish processing bases. The packer makes frequent trips back to Hay River bringing fish.

as many arrangements between fisherman and fishing company as there are fishermen. The most formal element is the control of the Fisheries Department. The lake is divided into several areas (Figure 11) each with a quota; hence fishing effort is spread over the lake and possible overfishing can be counteracted. The Department also examines fish to ensure they are not over encysted. Thus about thirty government employees are connected with the industry.

The summer fishery, June 14th to September 15th, is carried on from small boats, from 25 feet to 45 feet long and capable of carrying between three and five tons.⁵ The skipper borrows or hires the boat from the company and pays the crew; food and supplies are normally supplied by the company who take delivery and pay the skipper by the pound. Whilst area I is being fished the boats bring the catch back directly once a day. Later with the shift to the other areas, temporary bases, barges which can be towed around the lake and where fish are processed, are set up; packer boats bring fish back and they are loaded into trucks and taken south. In the case of one company operating from Ptarmigan Point about half the summer catch is moved out through Yellowknife. At Dawson Landing a more permanent fish camp has been set up since 1964, with a permanent fish processing plant and a store. Here fishermen's families will live for the summer, generally in tents. Fish are trucked from here to Hay River about three times a week.

Winter fishing is a quite different operation, and the season is December 1st to March 31st. Fishermen live in cabooses, portable

⁵In 1965 thirty-eight boats operated; twenty-eight were steel.

cabins twelve feet by ten feet with room for two or three men. Nets are set through holes in the ice which gets progressively thicker as the season progresses. The catch is taken back by bombadier, an enclosed, tracked vehicle for snow and ice travel. Because fish are less active in winter the cabooses are moved every three or four days. In general outfits are owned by individual fishermen who employ the two others, and sell to the various companies. Recently fish have been flown back from more distant parts of the lake. Prices are generally higher in winter than in summer; thus winter fishing despite hardship and difficulty is often quite profitable.

Annual production is about 6 million pounds,⁶ although recently it has fallen below this (Table XX). During the initial boom period catches were high, as much as 9.4 million pounds in 1949, but have fallen off considerably to a low of 5.2 million pounds in 1960.⁷ It is interesting to note that value over the years has almost doubled; in 1953 although 5.6 million pounds were taken, lake value was only \$470,000; in 1963 value for 5.5 million pounds was \$795,000. Although whitefish make up between 60 and 70 per cent of the catch, because of higher prices for trout, the two species normally make up half the value each.

For the numbers employed total fishing payroll is low,

⁶All weights used here are pounds round weight.

⁷Detailed analysis is not really possible here as since 1962 annual figures have included parts of two different winter fishing seasons.

TABLE XX - LANDED FISH GREAT SLAVE LAKE, WEIGHT
AND VALUE, 1945 - 1964 - Million Pounds

Year	Total	White- fish	Lake Trout	Lake \$000 Value	Market \$000 Value
1945	1.7	1.0	0.5	n. a.	500
1946	2.8	1.5	1.2	n. a.	n. a.
1947	3.6	1.8	1.5	n. a.	n. a.
1948	7.0	4.9	2.0	n. a.	n. a.
1949	9.4	5.3	4.0	n. a.	n. a.
1950	8.2	5.7	2.4	611	2,297
1951	6.9	4.1	2.7	535	2,262
1952	7.2	3.9	3.1	735	2,225
1953	5.6	3.1	2.4	470	1,511
1954	6.9	4.2	2.3	636	2,040
1955	6.5	4.1	2.2	742	1,529
1956	6.2	3.8	2.2	787	1,482
1957	5.7	3.6	1.9	750	1,356
1958	6.4	4.2	1.9	682	1,235
1959	5.7	3.3	2.0	702	1,146
1960	5.2	3.2	1.5	699	1,074
1961	5.5	4.0	1.0	674	1,178
1962	6.2	4.4	1.1	859	1,230
1963	5.5	4.2	0.6	795	1,330
1964	5.3	4.1	0.6	n. a.	n. a.

Source: Canada Dept. of Fisheries.

TABLE XXI - AVERAGE PRICE AT CHICAGO,
1962 - 1964, Fresh Fish ¢ per Pound

Species	<u>1962</u>		<u>1963</u>		<u>1964</u>	
	Fisher- man	Market	Fisher- man	Market	Fisher- man	Market
Whitefish	15	38	14	36	18	39
Lake Trout	20	50	16	50	25	56

Sources: Canada, Department of Fisheries;
U. S. Bureau of Fisheries, Market News Service.

TABLE XXII - FISHING INDUSTRY PAYROLL, 1953 - 1964

Year	Dollars
1953	163,027
1954	181,909
1955	171,033
1956	131,486
1957	146,667
1958	119,069
1959	161,415
1960	62,913
1961	60,397
1962	84,673
1963	110,835
1964	113,156

Source: Workmen's Compensation Board, N. W. T.

although it has shown a tendency to rise in recent years. The employed fisherman earns about \$200 or \$250 per month, plus keep whilst working; at most this amounts to about \$1850 per year; thus supplementary income is necessary. Skippers on the other hand do earn more and income varies between \$3000 and \$6000,⁸ but these total no more than forty men in any one season.

Of the white and metis fishermen, just over half are Hay River residents (Table XXIII), this being a reversal of the early fifties when 60 per cent or more were non-residents. This is in part due to the fact that some former transient fishermen have settled in the town. In the winter season more residents are employed, generally 70 per cent to 80 per cent. Wide variations and fluctuations make generalizations about this industry dangerous, but it does seem that about one third of the total number involved fish in both seasons. Most of the skippers are experienced fishermen who have fished the lake for ten years or more, but only about half of them are Hay River residents.⁹ Two companies seem to prefer non-residents, as they are more likely to work hard, long and consistently. However, better local fishermen are often skippers and almost permanent employees. Non-resident fishermen normally come from other fishing areas: Northern Saskatchewan; Lesser Slave Lake; Lake Athabasca; Lake Winnipeg.

⁸Information obtained locally.

⁹In 1958 one third only were residents.

TABLE XXIII - RESIDENT AND NON-RESIDENT LICENCES -
HAY RIVER - SELECTED YEARS

Year	Resident	Per Cent	Non-Resident	Per Cent
1951	123	40	180	60
1952	140	38	231	62
1953	161	39	252	61
1954	158	30	352	70
1955	182	44	231	56
1962	209	60	143	40
1963	185	69	108	31
1964	171	57	137	43
1965 (Summer)	121	63	72	37

Source: Dept. of Fisheries

Dressed fresh fish make up about 75 per cent of the fish marketed from the lake, the rest being frozen.¹⁰ The high quality of fish from the lake creates a great demand for it in the U. S. A.; thus about 90 per cent goes to the freshwater fish markets of Chicago, Detroit and New York.¹¹ An important factor in the marketing of freshwater fish is the

¹⁰Fresh fish are kept on ice at 32°F.

¹¹The rest generally has a higher cyst count than the U. S. A. will accept and is sold in Canada, mainly in Winnipeg. The cyst is not harmful, but unsightly.

existence of large Jewish communities in these centres which require such fish at religious festivals. Speed and efficiency of transport is the key--fish are trucked to Edmonton in a matter of hours and then railed to market in two to five days. Formerly Chicago took 90 per cent of the total, but since 1964 one company has been exporting to New York; thus Chicago only takes about 70 per cent at present.

Hay River produces little frozen fish as the high quality fish fetches good prices fresh; moreover the town has storage for only 100,000 pounds of fish. Hardly any filleted fish is produced. The extra labour required when added to the already high transport cost means there is almost no profit on filleted fish. Thus despite trends in both Canada and the U S. A. for filleted and frozen fish forms, Hay River continues to concentrate on fresh, whole fish.

The fact that fresh fish cannot be stored is an important factor in its marketing. Thus prices are controlled not only by the demand but by the state of fish on arrival. Thus fish buyers hold a tight control over the fishing industry in the North, and until recently two U. S. companies effectively controlled the industry through marketing, as Jeness says:

While ostensibly they vie with one another for the inland fishery trade, there is little doubt that they cooperate closely in maintaining a tight monopoly on all freshwater fish purchases. Concerning their inside operations little information exists but reliable observers are convinced that both companies work through hand-picked subsidiary agencies which emerge and disappear at will in order to get fish through customs, obscure gross taxable income and avoid monopoly legislation.¹²

¹²R. A. Jeness, Great Slave Lake Fishing Industry, Northern Coordination and Research Centre, Ottawa, 1962, p. 24.

As a part of Canadian inland fisheries the Great Slave Lake fishery is important. It makes a contribution about equal to Alberta in the total picture but by species makes a significant contribution in lake trout. Despite appearances the fishery is efficient when compared to other Canadian inland fishing; both the dollar and pound yield per man are high. However, this really indicates the poor state of Canadian inland fishing rather than the excellence of the Great Slave Lake in this regard.

TABLE XXIV - PERCENTAGE OF INLAND FISHING, NORTHWEST TERRITORIES, ONTARIO AND ALBERTA, 1962.

	N. W. T.	Ontario	Alberta
All species	5	49	7
Whitefish	18	16	10
Lake trout	33	--	1

Source: N. W. T. Today.

TABLE XXV - INLAND FISHERIES EFFICIENCY, 1962

	Value landed per man (\$)	Quantity landed Per man (pounds)
Ontario	1995	3000
Saskatchewan	800	805
Manitoba	780	610
Alberta	170	180
N. W. T.	2005	1390

Source: N. W. T. Today.

Hay River is the fishing town of Great Slave Lake and likely to remain so. Fishing is the major support of 21 per cent of the population, although many supplement this by income from other employment. It is the reason for the existence of the West Channel fishing village, where about forty families live and three of the companies have processing and storage facilities.

However, the total contribution of the fishing industry to the town today is less than might be imagined. Three of the companies operate their own stores and ship supplies in directly from Edmonton, only two bank in the town, and one company operates its own trucks. Moreover as has been seen fishermen generally fall into low income groups. Fishing is significant, however, to truck transport companies in generating both southbound and northbound freight.

(b) Future Prospects

Present production is well below the quota, and the lake does not seem overfished. In fact removal of the large fish means that a greater number of medium-sized fish are able to survive. Authorities feel that the quota could be raised to 12 million pounds without danger to the lake. Thus the natural resource base of the Great Slave Lake fishery seems both sound and assured.

About 70 per cent of Canadian freshwater fish is marketed in the U.S.A.¹³ Despite a general decline in demand for both whitefish and trout the Canadian share has been rising (Tables XXVI and XXVII); thus

¹³ Canada, Dept. of Fisheries, Canadian Fisheries Report, May, 1961, p. 3.

TABLE XXVI - PERCENTAGE LAKE TROUT AND WHITEFISH
RECEIPTS AT CHICAGO, 1953 - 1964

	<u>Lake Trout</u>			<u>Whitefish</u>		
	Total (million lbs.)	U. S.	Canada	Total (million lbs.)	U. S.	Canada
1953	3,580	53	47	9,014	37	63
1954	4,327	41	59	9,710	29	71
1955	3,579	32	68	8,820	21	79
1956	2,934	29	71	7,712	23	77
1957	2,428	20	80	8,069	14	86
1958	2,313	27	73	8,900	14	86
1959	1,926	33	67	8,246	14	86
1960	1,587	19	81	8,065	11	89
1961	1,341	13	87	7,064	12	88
1962	1,217	7	93	8,085	7	93
1963	1,086	6	94	6,574	11	89
1964	1,066	10	90	6,445	20	80

Source: U. S. Bureau of Fisheries, Market News Service.

the steady development of Great Slave Lake has continued. Two factors here affect the lake. First, if Canadian fish saturated the U. S. market the northern lakes may well be in a precarious position, despite quality. Second, consumer preference in the U. S. A. is turning to frozen and filleted forms, in which the Great Slave Lake cannot compete.¹⁴ Thus

¹⁴C. E. Cope, Receipts and Prices of Fresh and Frozen Fishery

TABLE XXVII - PERCENTAGE FRESH WATER FISH RECEIPTS AT
CHICAGO BY PROVINCE AND STATE, 1963 - 1964

Place	1963 Per Cent	1964 Per Cent
Michigan	18	17
Manitoba*	17	18
Alberta*	17	15
Wisconsin	12	12
Iowa	10	11
Minnesota	6	6
Illinois	5	8
Ontario	5	4
Florida	3	3
Others	7	6

Source: See Table.XXVI.

*Great Slave Lake fish are included here. In 1964 the lake provided 59 per cent of these fish.

the lake is taking a growing share in what is a decreasing market.

However, it is considered that demand will rise with increasing population, even though consumption per capita is falling.¹⁵ Average

Products at Chicago, 1963, U. S. Bureau of Commercial Fisheries, Market News Service, Chicago, 1964, p. 3.

¹⁵Canada, Royal Commission on Canada's Economic Prospects, The Commercial Fisheries of Canada, Ottawa, 1956, p. 24.

landings of white fish in Canada, 1951-1955 were 25 million pounds; by 1980 it is expected that this will rise to 36 million pounds. Since Great Lakes' production is forecast only at 4 or 5 million pounds there is some room for Great Slave Lake fish. If the Great Lakes succeed in restocking lake trout in 1966 as planned,¹⁶ then ultimately this will seriously affect fishing in the Great Slave Lake. Thus if the industry is not assured of expansion it does seem likely that production from the lake will continue at its present rate for the next few years at least. Because 90 per cent of Western Canada's inland landings go to Chicago, buyers have control over the production and it has been suggested that they are unwilling to let the lake's production exceed 6 million pounds.

There is much conjecture about possibilities for future expansion in Hay River itself. However least interested in this are the companies themselves. It is suggested that the four companies each have an adequate share in the industry and expansion would require unwarranted effort. As these are non-subsidized private ventures having concern to show a profit, they are generally less interested in community development and expansion as a whole than might be expected.

Thus greater use of local and Indian labour can be made only if they prove to be efficient reliable fishermen, although two companies are notable in their use of locals. Nor is it in the interests of the labour when these could easily fail, and economic advantage lies in the production of fresh fish. Indeed if, as has been advocated, a large

¹⁶ Lake trout have been seriously depleted by lamprey since the thirties.

government freezer were to be installed to hold fish against slack periods, this would be better located in Edmonton where Alberta fish could also be stored.¹⁷

Use of coarse fish (inconnu, pike, etc.) as a base for a fish meal industry has been considered, but greater amounts of coarse fish are taken elsewhere and meal could be produced and transported more cheaply further south. Since fur farming has not yet come to the Territories there is no local market for such a product.

Price subsidization, marketing boards and Indian cooperatives have all been advocated for the future of the fishing industry in Hay River.¹⁸ A marketing board, it seems, would meet much opposition from the companies, who prefer free competition, and to be really effective in face of U.S. control would have to organize all Canadian inland fishing. Price support would lead to the creation of a false economy, which again in view of U.S. interest might be a dangerous move. Even if an Indian cooperative could be set up, it is unlikely to be a significant producer.

In conclusion then it seems that fishing in Hay River is unlikely to change much in the near future, although prospects do not seem bright in the long term. Modernization and greater use of labour-saving devices are a possibility, although remote. In the town it seems that with the growth of other sectors of the economy, particularly transport and service

¹⁷R. A. Jeness, op. cit., p. 36.

¹⁸Sessional Paper No. 14, Votes and Proceedings, Northwest Territories Council, Twenty Eighth Session, 1964.



17. Two of the major fish companies, located on the West Channel.



18. The Hay River airport shortly after a day of rain. This "soft" runway is one of the major drawbacks to Hay River as a major air transport centre at present.

industries, fishing will begin to recede from the forefront of economic activity. However, in considering the fishing industry two points should be borne in mind. Although the fish are a resource base of the North they are exploited by companies which have roots outside the area and much of the labour is seasonal and non-resident, any government aid would be to what is essentially a non-indigenous industry. Secondly the dichotomy of the industry is that it is a resource base of the North and part of Canadian inland fishing; thus measures to develop and expand it may not be in line with developments elsewhere in Canada.

Transport and Communication

Since the period when the transport emphasis in Hay River was in shipping supplies to Yellowknife, the industry has grown slowly but steadily and has gradually taken over from the old Waterways-Fort Smith route as supply route to the Mackenzie River. Transport although fluctuating with the various booms and expansions in the North has not, in Hay River at least, shown such wide fluctuations as has the fishing industry. In order to provide a comparison of transport methods Table XXVIII is presented; it must, however, be borne in mind that each method has certain advantages depending on type of freight, destination and urgency.

(a) Air Transport

Although aircraft play a key role in the development of the North, Hay River is poorly developed as an air transport centre. The major drawback is lack of adequate runways; the present gravel strips are not only soft but are completely unusable with a two-hour downpour in the summer. Plans exist for a new paved runway on the south-west side of

TABLE XXVIII - GENERALIZED FREIGHT RATES, GREAT SLAVE
LAKE AREA, per 100 lbs., 1965

Method	Cost in Dollars
Barge	1.80 - 2.50
Truck	2.00 - 4.00
Bus	8.25
Air	15.00 - 20.00
Rail	300.00 - 340.00 (carload lot)

Source: Transportation companies involved.

Vale Island, to be completed by 1967, this will allow adequate air service to this growing town and complete the weakest link with its transport services.

In terms of charter aircraft Hay River is a base, but only three companies operate from the town. In terms of air miles in the Northwest Territories Yellowknife is much more centrally located, especially for mineral exploration. Only seven people are engaged in this, with five planes. Charter companies reported few areas served continually and most frequent destinations were Edmonton, Yellowknife, Pine Point, Fort Resolution, Fort Smith, Fort Reliance and the Wrigley Harbour Area. The most regular charter is weekly: Hay River, Snare Falls, Port Radium, Lady Franklin Point, when Canadian National Telecommunications service their scatter-wave stations. Sport fishing and freighting fish in winter make up most of charter activity, as well as considerable government activity.

TABLE XXIX - AIR TRANSPORT STATISTICS,
SCHEDULED, HAY RIVER, 1963 - 1965

Year	<u>Inbound</u>		<u>Outbound</u>	
	Passengers	Freight (tons)	Passengers	Freight (tons)
1963	1, 183	16	1, 037	17
1964	1, 645	43	1, 653	29
1965*	1, 126	32	1, 086	24

*First six months

Source: Pacific Western Airlines

Scheduled service is provided by Pacific Western Air Lines, as part of the Mackenzie service. Hay River receives a north and south bound DC-4 daily, Beechcraft to Fort Smith twice per week, and once per week to Fort Resolution. Although Yellowknife handles three times as many passengers and three times as much freight as Hay River, air traffic has shown considerable increase in Hay River recently; between 1963 and 1964 number of passengers rose by 48 per cent, and amount of freight rose by 115 per cent. It seems likely that 1965 will show further increases.

(a) Water Transport

The advance of roads and winter road operations in the north has gradually encroached on the barge freight movement, particularly in the Great Slave Lake area with the opening of the Yellowknife Highway in 1960. However, water transport still remains the most important method of moving bulk goods in the North and by this method both the Mackenzie River and the Western Arctic are supplied. Since the mid-fifties more



19. The Hay River dockyard at the height of summer activity. Both a "reefer" barge, used for perishables, and a flat barge may be seen.



20. Part of the water front. Two barges lie loaded ready to go north. A packer is unloading fish.

north-bound freight has gone through Hay River than Fort Smith, and whilst this activity is also dependent on seasonal largely non-resident labour it is crucially important to the region as a whole.

By the 1960's only two water transport companies operated in the Northwest Territories, Yellowknife Transportation Ltd. and Northern Transportation Company Ltd. The former, operating exclusively from Hay River, mainly carried bulk petroleum (nearly 70 per cent of total volume) and generally hauled about 60 per cent of freight by volume moving in the Northwest Territories. Previous to 1960-61 hauling to Yellowknife was very important; in 1959 17,000 tons of waterborne freight reached there, about 25 per cent of the total reaching Great Slave Lake.¹⁹ In recent years the bulk of freight has been destined for points down the Mackenzie and it is hoped to expand operations in the Arctic Islands in the future.

Two major factors must be noted before proceeding. In winter 1965 Northern Transportation bought out Yellowknife Transportation and now is the sole company operating water transport in the Northwest Territories. In December 1964 the Great Slave Lake Railway reached Hay River. This will mean the virtual disappearance of the Waterways - Fort Smith route for north-bound freight, and the dominance of Hay River as a break of bulk point for northern supply.

Thus in 1965 40,500 tons went north through Hay River and only 4,000 tons through Fort Smith; this total was not as high as 1964

¹⁹For most of the information in the section the author is indebted to Mr. G. Inglis and Mr. S. Robinson of Northern Transportation Company Ltd.



21. A tug pushing two barges into Hay River harbour. As many as six of these steel barges may be handled by the larger tugs.



22. A typical blunt-bowed tug returning to Hay River after a "dash" to Fort Providence in the early summer. The white line in the background is ice, which prevents navigation getting into full swing until mid-June.

or 1963 (Table XXX) but this may be due to a reorganization of the company. The total was comprised of supplies of all kinds, food, building materials, houses, machinery and parts, heavy equipment, bulk petroleum and general supplies.

Bulk petroleum, both bunker and diesel, is still an important item. Formerly this was shipped south from Norman Wells to the Great Slave Lake area, but, with increasing demands on the Arctic coast,²⁰ more is brought from the Edmonton area. The cheapest method is by rail to Hay River and then barge. In this way much of Yellowknife's demands are met, and also those of Fort Smith, Fort Resolution and even Fort Simpson, a total of some 13,000 tons.

Southbound freight fell, in 1965, to 8,000 tons, and was mainly drilling rigs and equipment returning from the Western Arctic and the Wrigley area. Bulk fuels were special types produced at Norman Wells. An interesting new development is the hauling of silver and copper concentrate from Echo Bay on Great Bear Lake. This is railed south from Hay River; possibly the first influence of the railway affecting developments to the north.

In Hay River water transportation provides at present only seasonal employment during the short summer flurry of activity from June to September. But it does seem that Northern Transportation is making Hay River a major northern agency, and during 1965 considerable warehouse construction was going on along the water front. Since

²⁰ Both domestic and drilling activity.

TABLE XXX - WATERBORNE FREIGHT ON SLAVE RIVER, GREAT
SLAVE LAKE AND MACKENZIE RIVER, 1958-1965 (in tons)

	<u>Northbound</u>				<u>Southbound</u>	
	Hay River (To Yellowknife)		Fort Smith (To Yellowknife)		Hay River	Fort Smith
1958	35,276	n. a.	29,270	(10,151)	8,048	4,010
1959	46,925	n. a.	27,371	(9,681)	13,590	3,626
1960	39,202	(7,766)	16,675	(5,452)	18,946	4,545
1961	39,830	(7,980)	9,062	(1,548)	15,559	3,981
1962	37,176	(4,500)	5,899	--	22,115	4,674
1963	38,465	(3,182)	10,262	(1,308)	27,698	4,603
1964	47,883	(3,235)	9,065	--	22,076	4,163
1965	40,500	(10,500)	3,918	--	8,010	3,444

Source: Northern Transportation Co. Ltd.; Yellowknife Transportation Co. Ltd.

TABLE XXXI - PERCENTAGE TOTAL WATERBORNE FREIGHT
HANDLED BY FORT SMITH AND HAY RIVER, 1957 - 1965

Year	Hay River	Fort Smith
1957	52	48
1958	51	49
1959	58	42
1960	66	34
1961	73	27
1962	77	23
1963	75	25
1964	75	25
1965	75	25

Source: Northern Transportation Co. Ltd., and Yellowknife Transportation Co. Ltd.

TABLE XXXII - WATERBORNE SOUTHBOUND FREIGHT TO HAY RIVER, 1965 (in tons)

Area	Commodity	Tons
Port Radium	ore	2, 200
Wrigley Area	drilling equipment	1, 400
W. Arctic	drilling equipment	1, 400
Norman Wells	bulk fuel	2, 600
Miscellaneous shipments		410
TOTAL:		8, 010

Source: See Table XXX.

TABLE XXXIII - TOTAL BULK FUEL DELIVERED TO YELLOWKNIFE 1960 - 1965 (in tons)

Year	Norman Wells	Hay River
1960	9, 950	7, 766
1961	11, 081	7, 980
1962	13, 241	4, 500
1963	17, 072	3, 182
1964	15, 145	3, 235
1965	6, 991	10, 500
TOTALS	73, 480	37, 163

Source: See Table XXX.

1965 the repair and machine shop has been closed during the winter and work on tugs and barges is not envisaged during the winter. Eventually the whole river fleet north of Fort Smith of 28 tugs and 111 steel barges will be based in Hay River, when shipyard facilities have been expanded. It is conceivable that greater demands may be made

on local labour, but of course the lack of skilled labour is a considerable drawback.

There are no real problems as regards harbour facilities in Hay River. The most serious is the silting of the river mouth which must be continually dredged to keep the requisite depth of nine feet. This, however, is a relatively small operation. Extra docking facilities are available if needed and use can be made of the islands in the river. The major drawback occurs in spring when during breakup ice and flood water can cause damage; however, the proposed flood control dyke may help here.

Despite the short season, barge freight is essential to the opening up of the North. Of course as roads are extended this importance will be lessened, but movement by water will remain the cheapest method for bulk goods. In the Lake Athabasca tar-sand area movement by water over 26 miles is cheaper than road, despite handling. Even if a road is pushed through to Fort Simpson Hay River will remain the major base of operations for there are no major navigation hazards in the 1,122 miles to Tuktoyaktuk on the Arctic Coast, and the town will remain the railhead for many years to come.

(b) Road and Winter Road Transport

Since 1948 truck transport has been the major method of supply for the town itself, but as has been seen it is also closely linked to the fishing industry. For sixteen years it has been the only method by which freight for the North was taken to Hay River for transfer to barge. Until 1960 most of the road freight to the Northwest Territories went to Hay River, but with the extension of the highway to

Yellowknife and expansion of winter road activities to a radius of 300 miles from base, this is no longer the case.

Trucking is important in the town; some 29 persons are engaged in the activity; there are about four small local companies and the two major outside companies of Grimshaw Trucking and Distributing Ltd. and Byers Transport Ltd. Road haulage does generate some activity in the town with limited service requirements. Moreover, it is a year round activity and now increasingly important in the winter; hitherto this has been considered a slack period.

Statistics for road haulage are difficult to obtain as companies deal with freight on a load or part-load basis; thus figures here are based on 1965 statistics alone.²¹ In 1965 approximately 21,000 tons of freight were hauled into Hay River, which is less than half the 43,000 tons hauled into the Northwest Territories as a whole in 1964.²² About 25 per cent of this was destined for Hay River itself and Pine Point. The rest, ranging from foodstuffs, meat, vegetables and canned goods to heavy drilling equipment, houses and machinery, was for transfer to all points in the Mackenzie District.

As with barge traffic, southbound freight is distinctly limited, and is one of the factors that tends to increase the

²¹The author is grateful to Mr. B. Wilson of Grimshaw Trucking, and Mr. R. Seddon of Byers Trucking for help here.

²²Alberta and Northwest Chamber of Mines, Annual Report 1964, Edmonton 1964. In 1965 much bulk petroleum moved by rail, thus Hay River may have had a greater percentage than this.

SURFACE TRANSPORT ROUTES MACKENZIE VALLEY

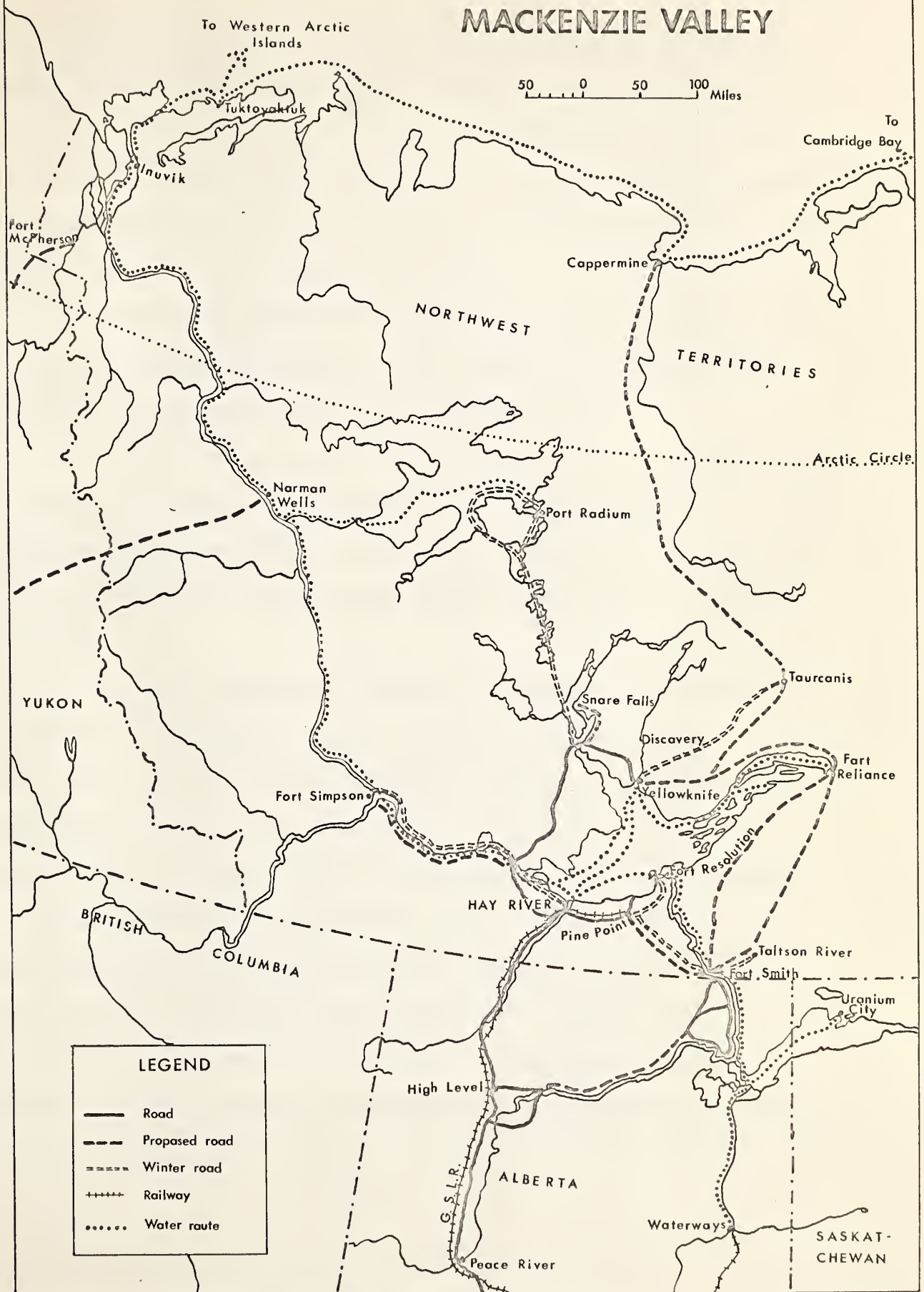


Figure 12

cost of northern operations. In 1965 some 7,146 tons were carried south, mainly machinery for repair, equipment from the far north, empties of all kinds of oxygen and propane cylinders and bottles, and of course fish. The latter whilst only 15 per cent by weight accounted for more than half the value, and in fact accounts for about 30 per cent of the total income of trucking in Hay River.

Taken together the two major companies show that about 50 per cent of freight by weight and value is moved for the government, particularly that transferred for shipment down river.

It has been suggested that now the railway is completed it will seriously affect the trucking industry, and in 1965 most of the petroleum products came to Hay River by rail in 1965. However, apart from this the operators seem very optimistic and 1965 did not seem to show any decrease.

Since transport and economic development are closely linked, the growth of the North will mean a general increase in freight. The existence of rail and road will probably not lead to competition but to specialization and truckers will be able to concentrate on what they are best suited to haul, general small package and diversified freight, and to provide a better and possibly cheaper service. Clearly rail can compete only in bulk goods and on a car-load lot basis, carrying grain, timber, petroleum, flour, cement, etc. Fish it seems, will always be carried by truck for two major reasons: fresh fish cannot be stored to make a car-load lot, and in any case this would

mean a fish plant located in the Vale Island townsite; since speed is essential the shunting necessary at Roma means that the fish could not arrive in Edmonton as quickly as by road.

Two developments could affect the trucking companies, however. If the railway were to locate its own truck in Hay River, this would be strong competition. Piggy-back services, despite discussion on their economic advantages, would remove the Edmonton to Hay River haul. However, in the immediate future C. N. R. does not seem to be looking in either direction.

One new service that has grown up with the railway is trucking from the Hay River railhead round to Yellowknife. Goods in car-load lots such as flour, cement, cement blocks and plywood are trucked from Hay River to Yellowknife. In 1965 1,200 tons were moved in this fashion. Thus once again Hay River is acting as a break of bulk point and distributing centre.

One other service which trucking companies are developing, using their flexibility to a maximum, is winter road operations. Replacing the old slow and expensive cat trains,²³ convoys of heavy trucks ploughing their own road are an important method of northern supply.²⁴ Between 1960 and 1964 well over 30,000 tons were carried

²³ Cat trains ceased operation in Great Slave Lake area in 1961-2.

²⁴ W. C. Wonders, "Roads and Winter Roads in the Mackenzie Valley Area," Occasional Papers Canadian Association of Geographers, B. C. Division, May, 1962.

on winter roads in the Great Slave Lake area, largely out of Yellowknife. All weather highways often follow where winter roads have led.

Hay River is also a centre for winter road operations. During the 1960's winter roads have been constructed and used in successive seasons to such points as Fort Smith (a gravel highway will soon be completed), Taltson River power site, Pine Point (now linked by gravel highway), Fort Resolution, Fort Simpson and direct to Echo Bay (Port Radium) on Great Bear Lake. During the winter both Simpson and Resolution are kept supplied with groceries and dry goods, and fish is brought back from Resolution. Operations to Great Bear Lake are expanding, and in 1965-6 it was hoped to carry in about 1,000 tons of supplies, machinery, etc., and bring out 2,000 tons of concentrate (almost as much as the barge freight) to be railed south from Hay River.²⁵

Besides flexibility, cost is the major advantage in winter road operations. The 150-mile road to Fort Simpson costs about \$10,000, or \$66 per mile; a 300-mile road costs \$30-35,000. In contrast the 280 mile highway to Yellowknife cost twelve million dollars or \$20-60,000 per mile. Thus the importance of winter operations in the North is clear, especially when it is remembered that northern developments are frequently small and transitory and cost of servicing by normal methods would be abnormally great.

It seems that for the Northwest Territories as a whole both Yellowknife and Hay River are of equal importance as centres of truck transportation, both servicing their own areas.

²⁵Edmonton Journal, January 31, 1966.

Bus transport facilities are something that have grown in recent years, especially the "bruck" development which is probably the fastest reliable method of shipping small-package, urgent freight.²⁶ Hay River is the centre and major transfer point to Yellowknife and Pine Point. It is served by a twice-daily bus from Edmonton and there are connections three times a week to Yellowknife. Table XXXIV shows the statistics of the operation. From this it can be seen that bus traffic is more important in servicing Hay River than is air traffic; another indication that the town's links and similarity to southern centres are greater than most other northern centres.

TABLE XXXIV - BUS TRANSPORT STATISTICS, N. W. T. 1963 - 1964

Year	<u>Mackenzie Highway</u>		<u>Yellowknife Highway</u>	
	Passengers	Freight (tons)	Passengers	Freight (tons)
1963	16,876	56.4	2,406	27.9
1964	20,910	62.3	2,406	25.4

Source: Alberta and Northwest Chamber of Mines, Edmonton.

(d) Rail Transport

The Great Slave Lake Railway costing some eighty-four million dollars was completed to Hay River in December 1964. From Roma, the junction which links it into the Northern Alberta Railway

²⁶ A "bruck" is a bus with the rear half adapted for carrying freight.



23. A corner of the Hay River dockyard in Winter, showing small ice-blocks and some of the problems caused by congestion (courtesy D. W. Gamble).



24. The Hay River marshalling yard. Bulk oil is no longer moved by road, but by rail.

system, it roughly parallels the Mackenzie Highway for about 372 miles to Hay River. Seven miles south of Hay River the line becomes two branches, one to Hay River and one to Pine Point 53 miles to the east. The first raw ore was sent from Pine Point by rail in November 1964. Built primarily to allow Pine Point to go into production, the line also services Northern Alberta and may open up some agricultural land. It has also made Hay River the most northerly rail terminal in Canada (by eight minutes of latitude) and the port of the Mackenzie.

The line is not yet in full operation, though it should be ready some time in 1967 when ballasting work is finished. Thus it is operating only a limited service; however, just less than half the waterborne freight moving down the Mackenzie River, reached Hay River by rail in 1965, this being, as far as the railway is concerned, backhaul. As we have seen a limited amount of freight was also taken up for the Great Slave Lake area. Freight carried has already exceeded expectations. It was based on an expected tonnage of ore of 215,000 tons; in the first year over 300,000 tons were shipped south.²⁷ Expected annual north-bound tonnage was 77,000 tons; what percentage of this would reach Hay River is not clear, but it is said that such freight would be mainly bound down the Mackenzie.

It is too early to estimate what effect this has had on the town. In the building stage it did provide considerable employment

²⁷Edmonton Journal, January 20th, 1966.

both for natives and marginal whites. However, at present there is only one permanent employee in the town. Already considerable loading and warehousing facilities have been erected along the waterfront and of course a large marshalling yard has been laid out, but little else. Since the railway will not have less than carload lots, extensive warehouse facilities would be necessary if general use were to be made of the line. However, it does seem likely that before long a number of persons will be connected with the railway in the town, and possibly minor auxiliary services might be built there.

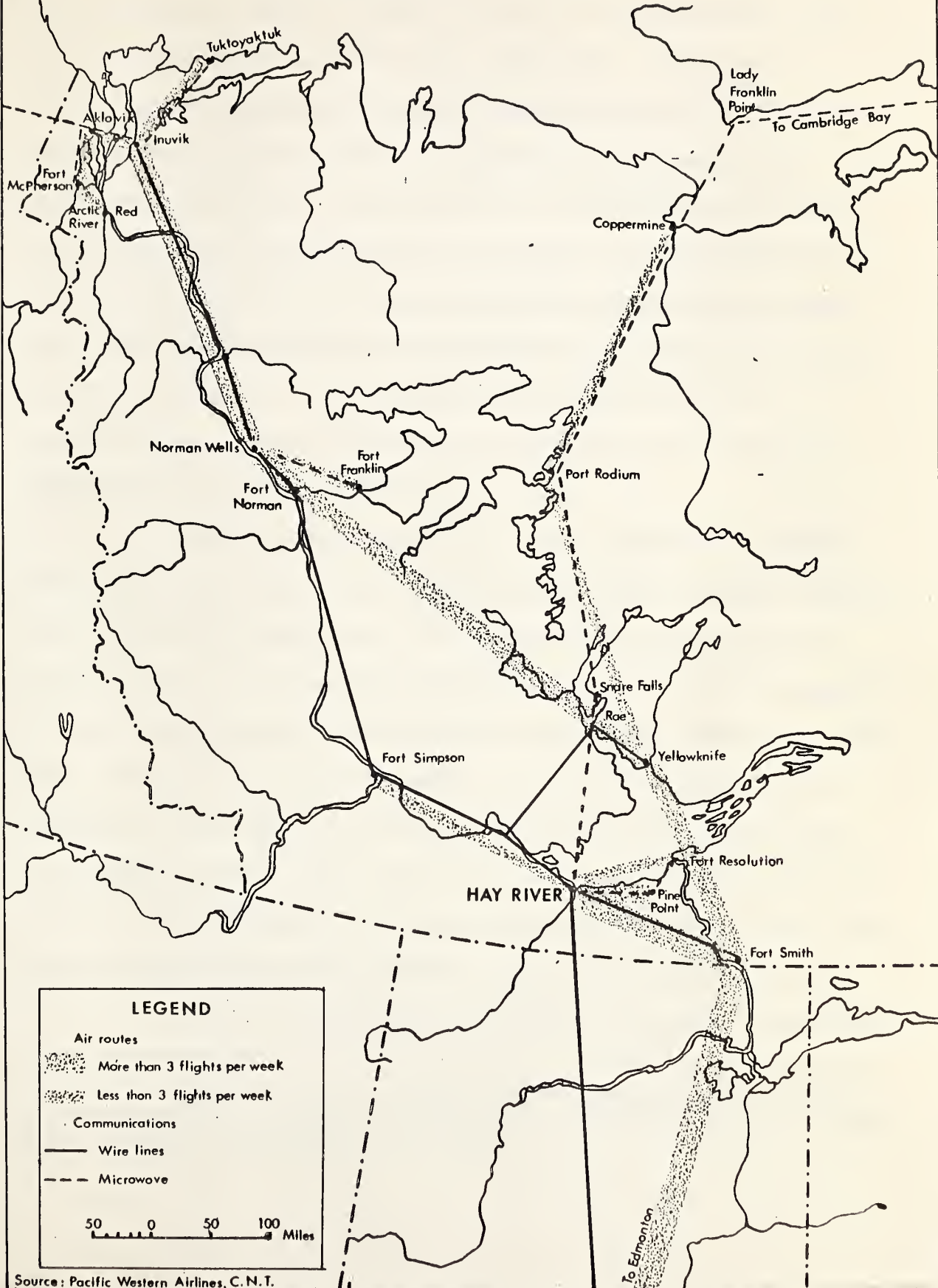
Communication

In the modern world efficient and instantaneous communication is considered a necessary adjunct to business and expansion. Today it is necessary for communications to precede or at least accompany increased economic development; thus good telephone and teleprinter services are now essential in opening up the north.²⁸ Such facilities speed up business, lessen the sense of isolation and provide links with outside developments in business and industry.

Canadian National Telecommunications provide these services in the Northwest, and in 1960 located the centre of their Northwest Territory system in Hay River, as the town is better located to link in with the Alberta Government Telephone system. In 1962 the micro-wave system was completed to Hay River, and subsequently extended to Fort Providence, Yellowknife, Pine Point and Fort Smith

²⁸ J. S. Ford "Communication in the North, " a paper presented to the Third National Northern Development Conference, Edmonton, October 21-23, 1964, 4 pp.

SCHEDULED NORTH BOUND AIR ROUTES & COMMUNICATIONS



Source: Pacific Western Airlines, C.N.T.

Figure 13

from Hay River. Work in 1966-67 should see completion of the pole line to Inuvik, and the eight feet wide right-of-way, will link all the Mackenzie River settlements into the Hay River system.²⁹ Thus the period 1960-1963 may have been a significant turning point in the development of this part of the North, as for the first time convenient and instantaneous communication was available. In 1964 the Scatter-wave Defence System was completed with one station on the northern part of Vale Island and others at Port Radium and Lady Franklin Point on Victoria Island. In 1966 franchise has been given to C. N. T. to develop telephone communication at these points, and at Coppermine, linked with the Scatterwave System.

The part played by C. N. T. in the community is considerable and growing rapidly. The agency employs some 79 people, although only 29 are based in Hay River, and this has grown from five in the last three years. The company provides housing for married employees and does encourage permanent residence in the town. Moreover, a good deal of income to the hotel, the motels and cafes came from C. N. T. as they do not have their own facilities as does N. T. C. L. ; they are a year round operation. Thus in generating economic activity in the town C. N. T. contribute at least as much as other transport enterprises, and in fact total spending was the greatest single total of all enterprises.

C. N. T. is significant in Hay River not only as a community

²⁹It is interesting to note that working farther north each successive winter, a C. N. T. truck has been driven all the way from Hay River to Inuvik, reaching there in 1965.

builder, but also as an enterprise enhancing the regional importance of the town.

In addition transport is significant in the town in other ways. Considerable employment and income is generated by airport maintenance, highway maintenance, and dredging operations. Hay River is the major centre for the work carried out to improve navigation on Great Slave Lake and on the Mackenzie River. However, it is the regional function of Hay River as a break-of-bulk and distribution centre, that is most important.

CHAPTER VI

HAY RIVER: ITS ROLE IN THE NORTHWEST TERRITORIES

By population alone Hay River is significant in the Northwest Territories. It is the second town, after Yellowknife, in the southern part of the District of Mackenzie. The total net value of production in the Northwest Territories is approximately \$25,000,000; primary production mining makes up 85 per cent, fishing 8 per cent, fur 4.5 per cent and forestry 2.5 per cent.¹ Because Hay River has no mining activity, its contribution to the economy of the Northwest Territories by value does not appear as distinctly as that of Yellowknife and the other mining towns. Moreover it seems likely that mining development on the southern shore of Great Slave Lake will be dominated by Pine Point.

The total contribution of Hay River to net value of production in the Northwest Territories amounts to approximately 10 per cent. Yellowknife on the other hand provides some 80 per cent of the value from mining in the Territories. Thus despite the fact that Hay River is the centre of the fishing industry its overall contribution, measured in these terms, does seem small. However, much of the town's importance lies in its functions as a port, a railhead, a communication centre, and a service centre.

¹ Figures are generalized over the last five years and based on Canada, Dept. of Northern Affairs and National Resources, N. W. T. Today, a reference paper for the Advisory Committee on the development of Government in the Northwest Territories, Ottawa, 1965, 136 pp.

Primary Area of Influence

Sivertz has indicated that while the Canadian North can be considered as a region it is in reality a series of regions more or less based on the key factor of transport and its effectiveness.² He recognizes that the Northwest Territories is really two units; the Mackenzie Valley area; and the Arctic Islands and West Coast of Hudson Bay. The Mackenzie River Valley (including Fort Smith) has about 68 per cent of the Northwest Territories' population; and has at least 80 per cent of the commercial activity.³ Based on transport Wonders has outlined the Mackenzie Valley Area,⁴ including in the south the Lake Athabasca area, with Waterways as the southern limit. With more detailed analysis and in the light of changes since 1961 a subdivision of these large areas is thought worthwhile.

In considering areas of influence in northern regions there are two major factors to be borne in mind. First, development in the North is frequently rapid, particularly when associated with mining and is almost entirely concentrated in small centres of population. Thus normal urban hierarchies have not yet developed nor are towns set amidst areas of rural occupancy and activity. Second, transport while

²B. G. Sivertz "The North as a Region, " Conference Background Papers, Vol. 1, Resources for Tomorrow Conference, Montreal, October 1961.

³N. W. T. Today op. cit., p. 92.

⁴W. C. Wonders, "Economic Change in the Mackenzie Valley Area, " Can. Geogr. J., Oct. 1961, pp. 138-147.

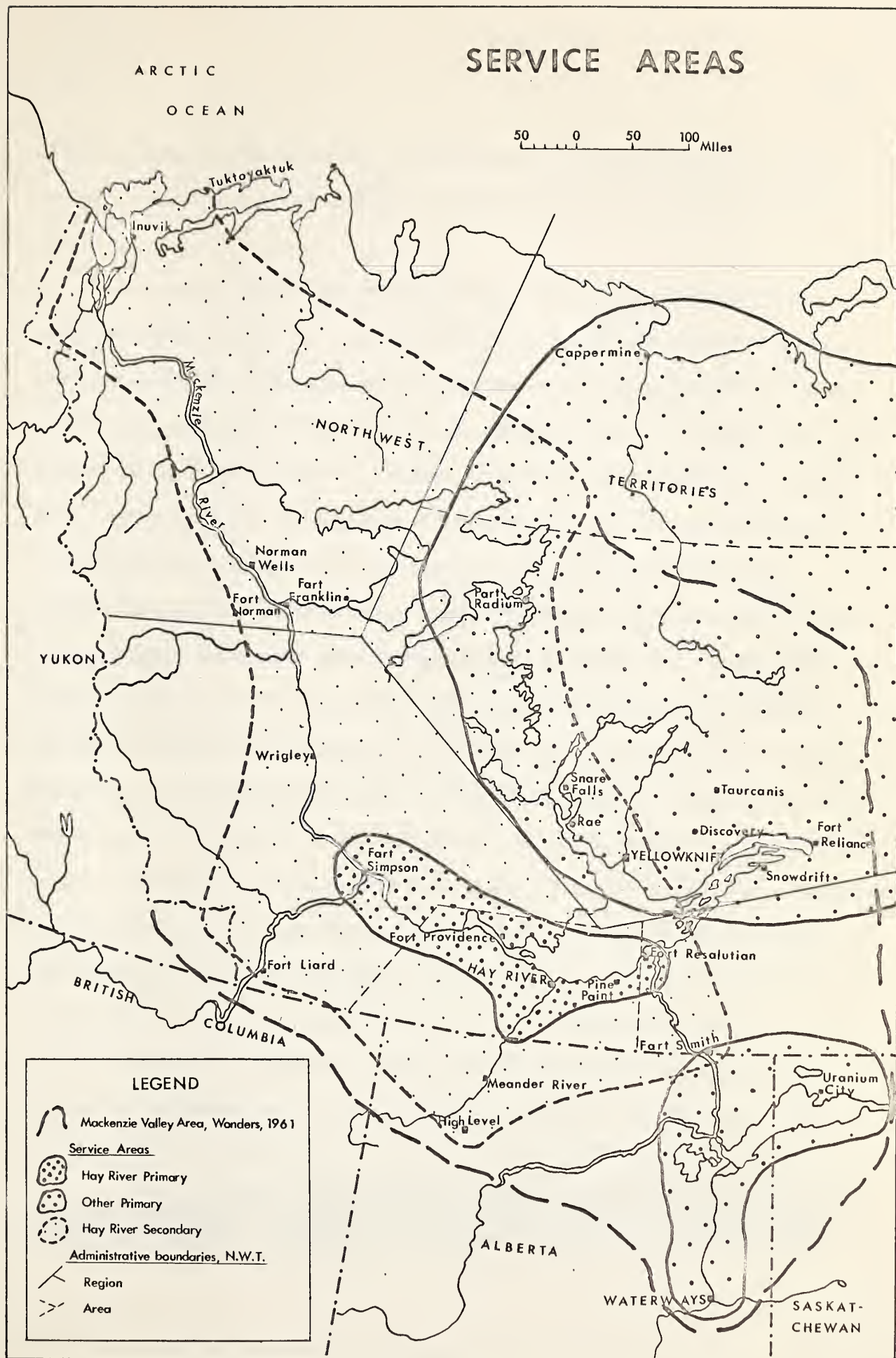


Figure 14

highly organized and generally efficient is concentrated in only a few routes, creating a greater degree of self-reliance in isolated communities.

In the case of Yellowknife, Bourne in 1962, established its primary region using the criteria of charter flying and administration, and established a functional region defined by announced criteria.⁵ As noted previously Hay River is of little significance as a charter base, and seems likely to remain so. In terms of administration Hay River plays only a minor part in the Northwest Territories; it is an administrative area within the region of Fort Smith, not a regional headquarters (Figure 14). Thus in these respects its regional function is almost non-existent when compared with Yellowknife or Fort Smith. On the other hand, as has been indicated in Chapters III and IV, Hay River bears a greater resemblance to normal small urban centres than either of these two towns. It therefore seemed reasonable to apply, insofar as possible, more usual criteria for establishing an area of influence.

Of the forty-five enterprises engaged in retail, finance, construction, community and personal services, only six, or 13 per cent, indicated that no business was done outside the town. Some, like the hardware stores, reported business with the whole Mackenzie River area as far as Inuvik. The volume of such business, however, was generally small, the greatest for any one enterprise was only 20 per cent. Thus

⁵L. S. Bourne, Yellowknife, N. W. T. A Study of its Urban and Regional Economy, Northern Coordination and Research Centre, Dept. of Northern Affairs and National Resources, Ottawa, 1963 pp. 112-118.

the primary area of influence was delimited by using enterprises reporting between 20 per cent and 5 per cent of business done outside the community, amounting to some thirty-four firms. There was considerable agreement as to the communities providing the bulk of this business, and the resultant area is shown in Figure 14. In view of the small absolute volume of this business further quantification was not attempted.

This primary area of influence, or embryonic functional region, includes the southern shore of Great Slave Lake and the extreme southern section of the Mackenzie River. It includes the settlements of Fort Resolution, Pine Point, Fort Providence and Fort Simpson; and the concentrations of people at Kakisa Lake, at Enterprise where the highway to Yellowknife leaves the Mackenzie Highway, at the Mackenzie Ferry and at the summer fishing camp of Dawson Landing. The total population within the area is approximately 4,000 or 23 per cent of the population of the Mackenzie District. In winter all settlements are linked by road as both Fort Simpson and Fort Resolution are served by winter road from Hay River.

Thus whilst small it is felt that this primary area of influence shows much more intensity than that of Yellowknife, and Hay River is a service centre in a true, but limited, sense.

For the future it is assumed that with the growth of Hay River, and the consequent increase in services available in the community, the primary area will not only intensify, but may enlarge. The projected road to Simpson will link the two communities more closely, although of course it will also provide direct links to the south. Similarly the

completion of the road from Hay River to Fort Smith, which should be by 1967, will bring this community within the area of influence of Hay River. With the loss of the transport function, it is unlikely that further growth or provision of services will take place in Fort Smith. Also the completion of the road from Fort Vermilion will provide direct connection south and this will probably sever the link between Waterways and Fort Smith. But although linked to the south by road, it will be 300 miles further to Peace River than to Hay River.

Secondary Area of Influence

The delimitation of the secondary area of influence was based on a consideration of transport and communication. As has been noted previously, Hay River is now the major port and railhead for the Mackenzie Valley area, and it seems that in future, freight moving through Waterways and down the Mackenzie will disappear completely.

An important aspect of this trans-shipment function of Hay River is the shipping of bulk petroleum, both diesel oil and bunker, which is railed up to Hay River and barged from there. Thus it is that both Yellowknife and Fort Smith, themselves service centres, are included within the secondary service area. Moreover, a certain amount of truck traffic is now moving from Hay River to Yellowknife.

Northern Transportation Company Ltd. provides service to all points down the Mackenzie River, including Great Bear Lake, and supplies the Mackenzie Delta area, the other major concentration in the Northwest Territories. Freight for the Arctic coast and islands is trans-shipped to ocean going vessels at Tuktoyaktuk; thus this would be the northern

limit of the secondary area. By transport then Echo Bay, or Great Bear Lake is serviced by barge in summer, and truck in winter both from Hay River. It falls within the secondary area of Hay River, although by charter flying Bourne placed the Eastern half of Great Bear Lake within Yellowknife's primary area.

As a functional centre for the Mackenzie Valley and Great Slave Lake areas, the importance of Hay River is nowhere better seen than in communications (Figure 13). Not only is Hay River the operations headquarters for the whole Mackenzie Valley and for some of the central Arctic coast, but is the link with southern Canada. Viewed in the light of the growing importance of communications in the development of the North, this makes the case for the secondary area even stronger.

To the south of Hay River the secondary area extends into Northern Alberta and includes the communities of Meander River, Steen River and High Level. This is based largely on use of medical facilities, particularly the new hospital in Hay River.

Quantification of the two criteria used here was not attempted as the secondary area is simple and straightforward. To the north the secondary area may be regarded as the "hinterland" of Hay River in its function as a port and road transport centre. Within this area lives some 73 per cent of the total population of the Mackenzie District.

It is from the above that certain modifications may be made to the boundary used by Wonders.⁶ It seems apparent that, with the coming

⁶W. C. Wonders, op. cit., p. 139.

of the railway to Hay River and transfer of shipping to that point, the Lake Athabasca area should be separated from the Mackenzie area, and would form a smaller area based on transport from Waterways, bounded on the North by Fort Smith. Ultimately when roads reach Fort Smith this area of influence will really be confined to Lake Athabasca itself.

Whilst it is still useful to think of the Mackenzie Area as a whole, it should also be realised that it may, with some justification, be subdivided; and this is done most meaningfully by taking the primary area of Yellowknife as outlined by Bourne and the secondary area of Hay River as indicated above. Whilst Inuvik may be acting as a service centre in the Delta area, Hay River and Yellowknife are really the two most significant service centres in the valley. The area most influenced by Yellowknife is that to the North and North-east of Great Slave Lake; and it is the major air centre.

With a view to future developments it must be remembered that, despite size, Yellowknife is not the major centre for water traffic, nor is it even on the main route; it is not the focus of roads. Hay River, on the other hand is a major transport centre, and has a much more intensive service area. In terms of water routes, roads and communications Hay River has an excellent location and does serve the Mackenzie District as a whole. Improvement of airport facilities and provision of surfaced runways will undoubtedly enhance this position. However, it is doubtful whether the fact that Hay River is 200 miles nearer the Eastern Arctic Islands than is Eastern Canada will, as has been suggested, mean an expansion of its service region to include this area.

It is felt that the regionalization attempted above is in line with the nature of development in the North, and that such a poorly developed area (in normal terms) does not warrant a full scale, detailed urban field analysis. The above areas are presented in a loose way in order to give some impression of various spheres of activity and some indication of intensity, particularly in the case of Hay River. However, it is recognized that the whole area is essentially within the service region of Edmonton, which encompasses much of the Western Canadian Arctic and Sub-Arctic. Hay River, Waterways and Yellowknife are lesser order centres.

CHAPTER VII

PROBLEMS AND PLANNING IN HAY RIVER

The establishment of modern Hay River in 1948-9 meant that many of the problems of the old community disappeared. The completion of the Mackenzie Highway placed the town a mere nine hours drive from the Peace River country;¹ thus whilst still on the frontier it was no longer isolated and distant; it was accessible to daily truck service and anybody could drive there. The town ceased to have its economic base in sporadic hunting and trapping and almost overnight became a significant transport centre and an important fishing town; from a small trading post it became a town of considerable regional importance. However, many of the problems the town faces today stem from the almost uncontrolled boom growth of this early period.

Location on Vale Island and Associated Problems

As has been seen, the "new" town of Hay River was located on Vale Island. The highway crossed the West Channel by means of a "fill" and terminated on the east side of the island close to the airport and already existing bulk petroleum facilities. From the very beginning the site was a poor one. Location on an island was in itself a problem as each spring the West Channel fill would be washed away and the settlement cut off by road for at least two weeks.² Moreover, the island is

¹Tractor trains took between five and seven days.

²A bridge was not built until 1964.

deltaic and low-lying and unhealthy and unpleasant environment, having a severe insect problem in the summer, and swept by cold winds from the frozen lake in the winter. The whole island is made up of recent alluvium (Figure 3) characterised in many places by wet and saturated soils and in low-lying areas by a good deal of muskeg. When these damp conditions are linked with the permafrost which exists in patches a particularly fluid active layer may result. Such wet conditions also make both construction and grading and upkeep of streets difficult. Moreover location close to heavily silt-laden water creates the problem of provision of a pure water supply.³

In view of these physical problems the establishment of two centres of settlement on the island was unfortunate. Thus servicing, road upkeep and provision of public utilities would ultimately prove more expensive than necessary. It seems unlikely that either the West Channel or the Indian village will ever be serviced properly. The existence of three centres has in the past led to a distinct feeling of separation. The Indian village remains isolated both physically and culturally, and there is also generally little contact between residents in the main townsite and those in the West Channel.

Both the West Channel village and the main townsite were laid out in the gridiron pattern originally. No thought was given to suitability of land for building, nor to the location of badly-drained and muskeg

³One reason for the high cost of the piped water system now being built, is the need for a four mile intake pipe out into Great Slave Lake.

areas. This means that for its population the town, in both areas, has covered an inordinately large area. Compact development has been at a minimum; in 1963 overall density on Vale Island was 4.3 persons per acre in the townsite and 3.7 in the West Channel; in the new subdivision overall density will be 8 persons per acre.⁴ In fact several streets existed with less than half their lots occupied, and many more streets were laid out, graded and maintained than were necessary for such a small community. Thus even servicing with electric power was spread out over a considerable area and at a high cost; any other kind of servicing for most of the improved areas on Vale Island does not seem likely in the near future. Since modern Hay River developed at a time when the importance of planning, both local and regional, was less widely recognized in Canada, there was little idea to develop residential or commercial zones. Thus homes, stores, transport yards and fishing companies were built in a disorganized manner, intermingled with each other. The town's "downtown" section straggled for almost a mile along Mackenzie Drive. In addition a limited amount of "ribbon" development took place between the main townsite and the West Channel fill, and between the main townsite and the fishing village. The net result of all this was to produce a community with an unattractive appearance, located in an undesirable environment, not a place where businessmen would wish to invest nor residents wish to stay.

Perhaps the major drawback to location in a deltaic island in

⁴C. Langlois, "Our Mining Towns: A Failure" Community Planning Review, March, 1957, pp. 52-63, recommended an average density of 40 persons per acre for sub-arctic towns. Yellowknife new town has 15 persons per acre.

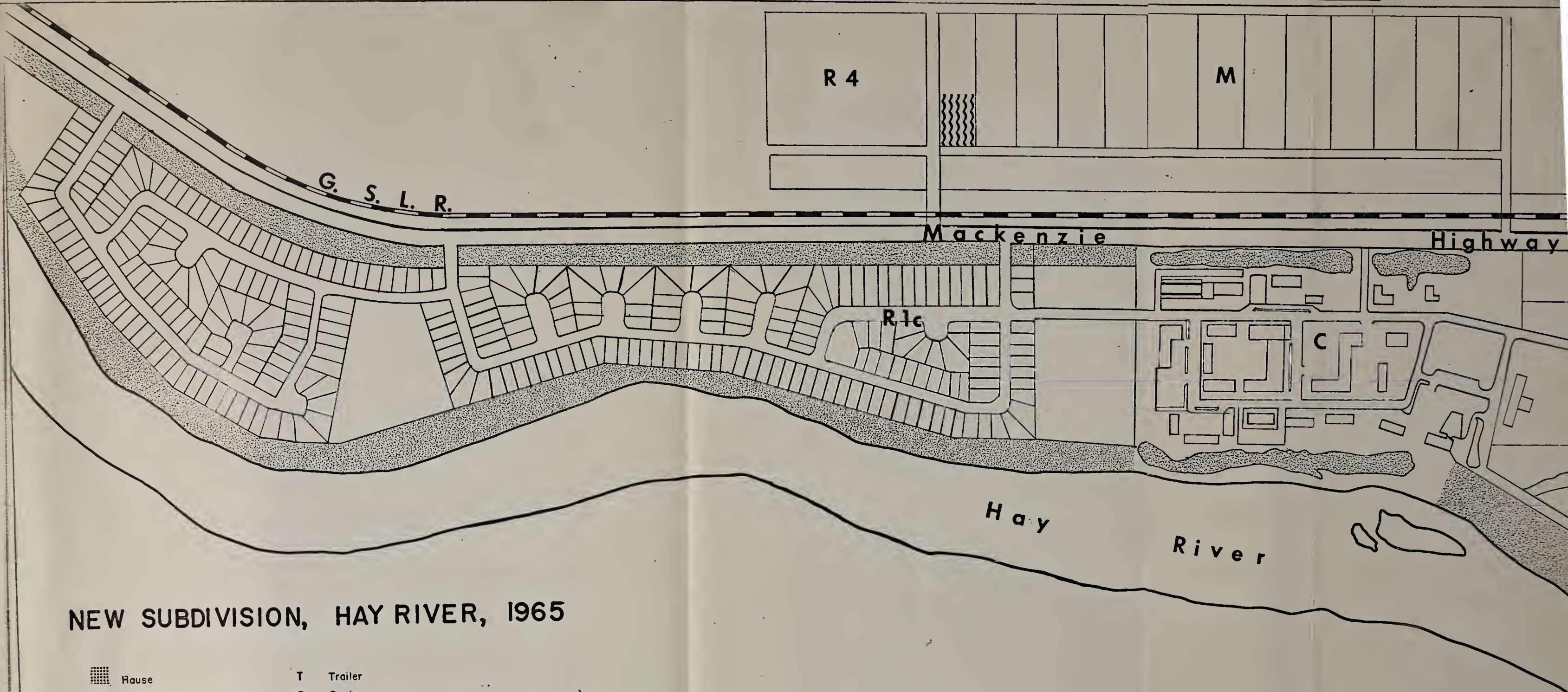
the North is the problem of flooding and damage by ice blocks during the spring break-up. This is particularly acute when the river flows northwards (see p. 10). It was this problem that finally led to the decision to relocate the residential area on a site free of flood danger, and to the present stage of a partially planned community.

Planned Hay River






The decision to move off the island in 1963 came at a time when the necessity for good, sound community planning was much more easily grasped. Thus in 1963 a zoning by-law was introduced in Hay River and all of Vale Island was zoned for industrial or commercial use and no further residential building was to take place. Such development was to take place within the planned subdivision on the mainland; this has since been planned to be a complete town (Figure 15).

After the flood of May 1963, action by the Territorial and Federal Governments was prompt. By July of that year the site at Mile Two had been chosen rather than that at Mile Seven where the rail and road junction to Pine Point was planned to be, but which offered very poor building conditions. The chosen site was not usually affected by spring flooding, and appeared to be free of permafrost after limited testing, and had "reasonably satisfactory soil condition for the construction of houses with basements."⁵ A subdivision plan was drawn up during the summer by Central Mortgage and Housing Corporation. Roads were constructed and lots laid out by autumn (see North residential area, Figure 15.). During the 1963-1964 winter some 75 houses were moved from Vale Island,

⁵Sessional Paper No. 13, Votes and Proceedings, Council of the Northwest Territories, 25th Session, May 3-5, 1963, Hay River.



NEW SUBDIVISION, HAY RIVER, 1965

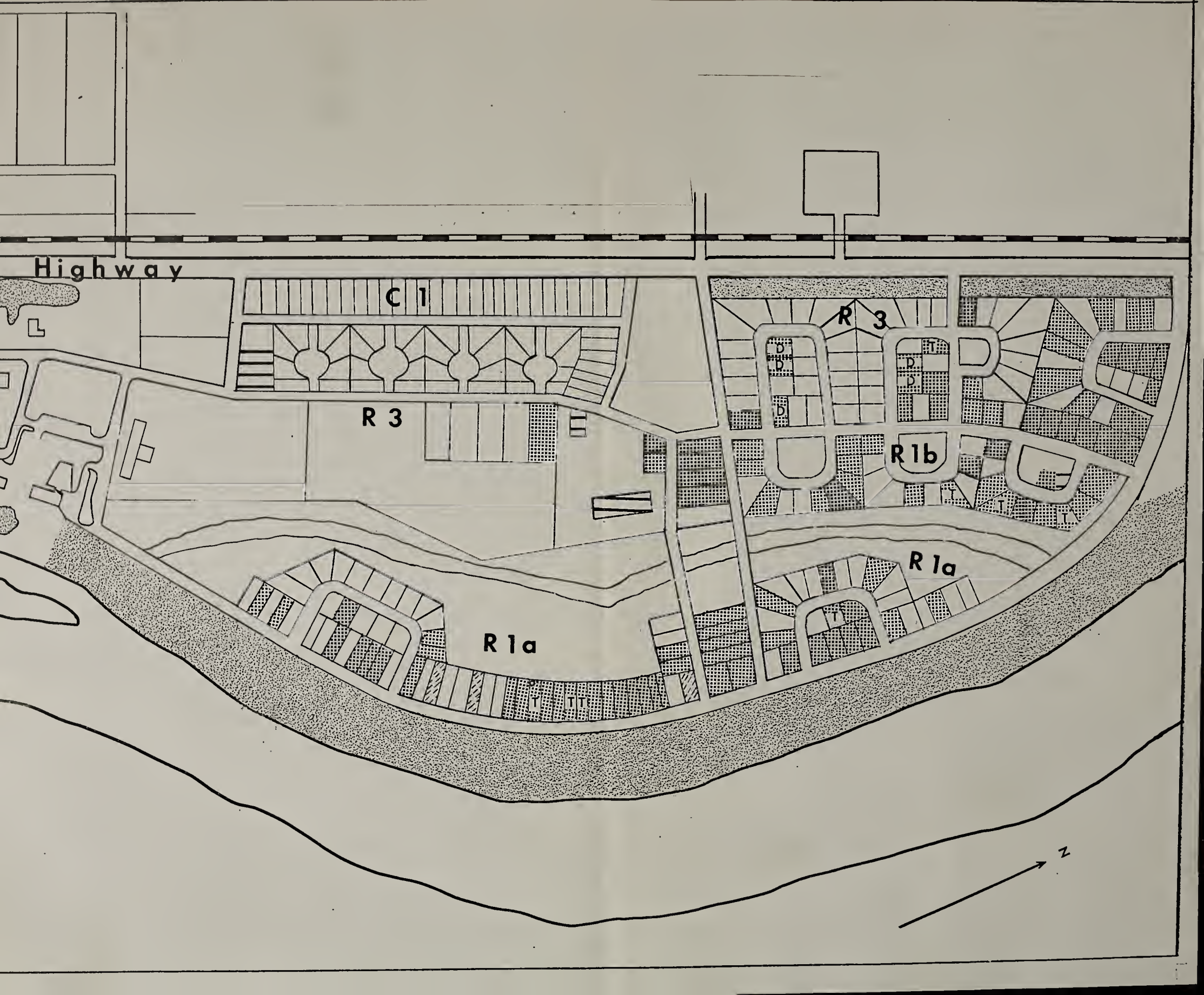
-  House
-  Tree retention zone
-  Service industry
-  Public utility
-  Shack or cabin

- T Trailer
- D Duplex
- R1a Single family residential (\$4,000)
- R1b Single family residential (\$7,000)
- R1c Single & two family residential (\$14,000)
- R3 Multiple family residential
- R4 Transient residential
- C Commercial center
- C1 Highway commercial
- M Industrial

500 0 500 1000 Feet

Source: Hay River Town Plan, Field survey

Figure 15



Highway

C1

R3

R3

R1b

R1a

R1a

N

and the following winter a further 75 were moved.

However the haste of early planning did bring some problems. Little thought was given to an overall control plan, thus many of the original lots are too low for the piped system of water and sewage now being installed and will have to be raised to a general level. Moreover the initial residential area, now the north-residential area, contains a good deal of development along one side of a road only; this, plus the wet and soft nature of the surface material, is a reason for the high cost of installing water and sewage services. The area originally zoned for the commercial area (now Highway Commercial zone) was found to be excessively wet and would have needed five years' drainage to make it suitable for large buildings in 1964 and early 1965.⁶ Thus this area was rezoned and the present plan drawn up; building began here in 1965 and continued in the 1965-1966 winter. Unfortunately this site appears to be underlain by disintegrating permafrost and may cause trouble and necessitate piling into the glacial gravels below.⁷

These early problems resulting from poor and insufficient planning led to a realisation that there must be a plan for the whole subdivision, including detailed layout of commercial and industrial zones. This plan was drawn up by a professional planning consultant during 1965 and approved by the Department of Northern Affairs and National Resources. Even so the present plan remains the unhappy marriage of two plans.

⁶Tapwe, Oct. 21 1964, and Edmonton Journal, March 31, 1965.

⁷Mr. J. Twack, Dept. of Public Works, Hay River, June 1965.

The aim of the present plan is to develop the area between the Mackenzie Highway and the river for a distance of about 2.3 miles south from the West Channel bridge, and to prevent unnecessary crossing of the highway and the railway.⁸ Only a small part of this area is recent alluvium, similar to that of Vale Island. The rest is either alluvial soil or brown wooded soil on alluvium both of which are much better drained than low-lying Vale Island. The area was mainly wooded. Only one feature breaks the generally level surface of the area; that is the old river channel about twenty feet below the general surface running through the north residential area; development has been planned to avoid this. The new townsite then has an elongated area and will incorporate two residential areas separated by a commercial zone. Industrial development is zoned to take place across the highway and the railway. A tree-retention zone is being left around the town to act as a shield from highway noise and dust, and to lessen the insect problem from the river in summer.

Development should take place in three stages with the first two overlapping. It is also assumed that the present number of about 1,000 people will remain in the West Channel, the Vale Island townsite and Indian village, for the immediate future at least. The first stage is the development of the north residential area, which began in 1963. By summer 1965 this was roughly half-developed and about 150 of the 250 lots had been taken up. When all 250 lots are in use the area should

⁸An outline of the plan is given by D. L. Makale in Tapwe Nov. 29, 1965.

contain about 1,000 people. Because of wet conditions, about 10 per cent of the lots will probably not be used. Stage Two is the development of the commercial centre which began in the winter of 1965 - 1966. This is planned as a series of enclosures, each being a set of connected buildings to minimize heating costs and provide compact development. The largest of these will be the commercial area, and this will embody shopping centre principles; municipal and government buildings will each form smaller enclosures. To date the skating and curling rink is completed and work is underway on the municipal and federal buildings. If all goes well these should be finished by 1968-9. It is felt that this centre would be adequate for a town of 20,000 people. The third stage is the development of the south residential area as future expansion dictates, and this area should hold a further 1500 people.

If Hay River becomes the capital of the Northwest Territories,⁹ this could mean an extra 1000 residents in the new townsite. It is hoped to absorb this by provision of composite housing close to the commercial centre, and the resultant higher population density would be welcomed in view of the elongated nature of the site and the limiting climatic conditions.

In layout the plan carefully avoids the gridiron pattern, although the site is relatively free of muskeg and unsuitable land. As has been seen, the ravine area is left undeveloped. An attempt has been made to

⁹The Carrothers Commission is at present considering this and other aspects of government in the Northwest Territories.



25. The new subdivision developed south of Vale Island on the mainland. This is the northern residential area, the only area developed up to 1965.



26. Part of the new subdivision.

avoid long, monotonous north-south streets, which is commendable in view of the shape of the site. In the south residential area and in the commercial area one-sided development along streets has been kept to a minimum as far as possible.

The plan does meet many of the requirements of northern planning and of planning in general.¹⁰ There is definite zoning, and there is a zoning bylaw, although the major problem of enforcing the bylaw still exists. There is also architectural control to ensure certain standards of housing; three zones of single-family dwellings at \$4,000, \$7,000 and \$14,000 are planned. Although the single dwelling unit lot is still the rule the subdivision is quite compact, much more so than Vale Island development, and of course the commercial centre is very compact. It might be argued that Hay River is not sufficiently far north to permit the complete negation of the general Canadian idea of one home on one lot, and the establishment of extremes in composite housing. Individualistic street patterns have been developed and unsuitable areas will be left as woodbelts or green areas. For long term expansion land has been left around the use zones, at present in the form of parks to permit some degree of expansion without encroachment. However, it does seem that if growth continues at the present rate, expansion to the west

¹⁰These are fully discussed in F. G. Ridge Principles of Planning in Sub-Arctic Communities, unpub. Ph. D. Thesis, Dept. of Geography, McGill University, Montreal 1953, 568 pp., and also in I. M. Robinson, New Industrial Towns on Canada's Resource Frontier, Research Paper No. 73, Dept. of Geography, University of Chicago, Chicago 1962, 190 pp.

of the railroad will be necessary at the end of the next twenty years. In terms of provision of services the plan is reasonably successful, and this should be at the minimum cost considering the nature of the soil and the prevalence of single family dwelling unit. It does provide two roughly equal-sized neighbourhood units which should foster a certain degree of community feeling and association, and may provide a greater degree of total community spirit than did the pre-1963 Hay River.

As a planned townsite then the new subdivision has much to commend it and the planner himself has said:

Hay River could become an outstanding urban community, and not only in the Northwest Territories. It is my belief, that at this point, both the government and the town have a unique opportunity to demonstrate what kind of community could be created, despite the rather unusual conditions under which development of the Northwest Territories is taking place.¹¹

It is not, however, part of an overall plan. The need for this has only recently been realised, and one will be available during 1966. But the planner will be faced with the perennial problem of preparing a plan for an area which is a product of various stages of development both unplanned and planned. Two major features which will be critical in the value of a master plan will be the provision of a strict, enforceable zoning bylaw, incorporating architectural control, and the allowance for frequent plan revisions at various stages.

One of the major problems is the increasing isolation of the Indian village. Native integration as rapidly as possible is one of the tenets of Northern Development. Changing the way of life of these people

¹¹ D. L. Makale, quoted in Tapwe, Nov. 29, 1965.



27. Part of the new subdivision. The Hay River flows beyond the trees to the right. Note development has been along one side of the street only, making later servicing expensive.

may turn out to be easier than integrating them physically, which will always be difficult as long as unserviced, unhealthy, native "shack towns" are permitted to exist, whilst great efforts are being made to provide properly serviced, pleasant towns to attract permanent white residents. Such conditions act as a severe brake on the process of integration.

Good planning should ultimately be concerned with encouraging the functions that are, and will be, important in the settlement and contribute to its growth. As has been seen the two major industries in this respect in Hay River are fishing and transportation. Fishing is clearly tied to the West Channel both legally and by existing facilities. It seems most unlikely that it will move from there. Thus Hay River will have an internal linear distance of some eight miles (a road along the West Channel is precluded by airport development there). Assuming that most service industries will ultimately move to the new townsite this means a greater problem than at present for the fishing community when the need to shop or use public facilities arises.

Much of Hay River's regional function is bound up in re-supply by water. Facilities for this such as shipyard, docks, warehouses and oil tank farms are all located on Vale Island. Despite possible ice damage it seems unlikely that these will be moved. Thus at first sight such planning as exists seems to have little regard for this major function. However, this operation is essentially carried out in summer, and it is not inconceivable that this part of Vale Island could become a kind of outport where major activity took place during the summer. At the present time N. T. C. L. does provide messing and dormitory facilities for its summer employees.

However, two immediate problems exist. Most small business operators are as yet unwilling to commit themselves to a move off the island at present, particularly in the summer when they see a good deal of business coming from transients. However, as more people move to the new subdivision, this should be an incentive to the small business man. Secondly the problem of major public buildings such as schools exists. It seems unlikely that either the federal or the separate school will be moved off the island; thus journey to school will remain a problem for some time.

Much of the planned development is associated with the hope that Hay River's functions will grow and diversify, and in particular that it will be chosen as the capital of the Northwest Territories. Robinson also sees a new kind of town developing in resource areas, and says that new settlements will be a "central, moderate-sized town as the residential-social-commercial and administrative centre for several resource activities (both immediate and long-range) in the surrounding region."¹¹ This is in line with the prevailing modern tendency of towns providing a greater concentration and range of services. As has been seen, Hay River possesses the most intensely developed service region in the Northwest Territories; thus provision of an adequate, planned community to support this role is essential. Obviously with respect to this function location away from lake shore and river mouth is not of crucial importance and when this will enable the development of a relatively pleasant and adequate community, capable of expansion it is a worthwhile step.

¹¹I. M. Robinson, op. cit., p. 36.

Thus in terms of the three functions of the town, fishing, transport and service, the move from Vale Island to a modern planned community may be shown to be at least partially consistent with the town's growth. Yet it must not be forgotten that the community at present faces many problems, and the complete shift could take as long as five years or more. The problems of a dispersed community and native integration will probably loom large in Hay River for some time to come. At present the community is very much a town in transition.

CHAPTER VIII

CONCLUSIONS

The present town of Hay River is the product of what might be called southern influences penetrating into the North. The duality of desire and need to develop those areas of Canada beyond continuous settlement led, in the Southern Mackenzie District, to a need for an improved transport system and the implementation of a policy to develop the fishery of Great Slave Lake for a commercial market. Thus under the influences of a new highway and a fishing boom, modern Hay River developed and became a port. Very rapidly the settlement in the delta was transformed from an Indian village based on hunting and trapping to a resource utilisation and re-supply town. Such growth has not been without problems. By 1964 the town had four distinct nuclei of settlement and was located in what is probably the poorest type of site for the development of northern towns. However, by 1964 the town had lost much of its earlier function of supplying Yellowknife. It had an increased regional function and some diversification of the urban economy had begun to develop.

The economic base of the town still rests firmly in transportation and communication and in the fishing industry. These two industries employ the greatest number of people and also generate the greatest amount of basic or town-forming activities. The number and importance of government employees, and the contribution to the town's income by

government grants are both significant facets of Hay River's economy, and their importance in the town has been shown. Yet it is contended that Hay River is possibly less dependent on government support than most towns in the Northwest Territories, certainly than either Yellowknife or Fort Smith. It has only a small administrative importance. One of the most important basic facts of the economic structure of the town is the lack of any one all-embracing company, or industry. Much of the development at present evident in the town is the result of a variety of small private ventures, with little or no direct government support or subsidization. This of course has drawbacks and may result in different activities pulling the town in different directions, a lack of concerted effort or a feeling of disassociation with the growth and development of the town in other directions. This aspect, however, does point to Hay River's greater degree of affinity with small towns elsewhere in Canada, than many northern settlements.

Basically Hay River is a two-industry town, but diversification is increasing, particularly in retailing, personal and community service. This growth, whilst not spectacular is important, as it was in this sector of the economy that Hay River showed a greater approximation to the small towns of Minnesota, than either Yellowknife or Fort Smith. Such diversification also gives the town a greater degree of stability and a wider economic base than most new resource towns in the North based, as they frequently are, on mining. Government administration centres such as Inuvik have a somewhat artificial economic base, and this activity is the sole reason for the town's existence.

Estimates of the possible life of mining towns are frequently made and ultimately, unless another activity replaces mining, all towns based on mineral extraction will disappear. Thus it was that Bourne was able to conclude that unless new gold is discovered close to the town, Yellowknife may only have a guaranteed existence of a further twenty years.¹ There seems little reason to doubt that Hay River will continue almost indefinitely. Fishing may well decline, but if this does happen, and this is certainly debatable, it would be a gradual decline over several years rather than overnight. Such a change might affect a considerable number of residents, but it would certainly not be the end of the town.

Hay River's function as a regional resupply centre seems likely to continue and increase, and may indeed increase considerably when a paved airport is constructed and the provision of train-to-plain facilities is completed. Present developments show that heavy bulk equipment can be moved by air and as a central railhead in the western Canadian sub-arctic, Hay River would be the logical centre for this. As a centre for truck transport Hay River is probably equally as important as Yellowknife. Further road building in the southern Mackenzie area seems likely to place Hay River at the centre of the system; thus here again it may develop as a logical break-of-bulk point. The town has recently become the major port of the Mackenzie District, and it is extremely unlikely

¹L. S. Bourne, Yellowknife, N. W. T. A Study of its Urban and Regional Economy, Northern Coordination and Research Centre, Dept. of Northern Affairs and National Resources, Ottawa, 1963, 160 pp.

to be ousted from this position. Yellowknife for instance is well off the main water route. Now that Hay River is the railhead, its importance is enhanced, and at the same time the transport function of Fort Smith has disappeared almost entirely. As has been seen Hay River is the centre for the communication system of the Mackenzie District and the Western Arctic. The growing importance of instantaneous communication in the modern world is in itself a significant factor in the permanence and future importance of Hay River. Clearly then, if the North-West continues to develop, as political and social pressures seem to indicate that it will, Hay River will grow with it.

As a service centre the town, by southern standards, is very poorly developed, but it does seem to have a distinguishable service area in normal terms, and one that is intensively used, although small, unlike Yellowknife which has a large but less intensively used area.

The recognition of some of the above facts and potentialities of Hay River has led to the proposition that Hay River be made capital of the Northwest Territories, and representation and submissions have been made on behalf of the town to the Carrothers Advisory Committee on Government in the Northwest Territories. In the view of the author Hay River has many advantages as a location of the capital, particularly as the new subdivision gets underway. Recommendations are likely to be made during 1966, by this Committee, and action may well be taken. It does seem that the choice of Hay River would enhance the town, increase its population, improve facilities more rapidly and give further diversification to the economy. If Hay River is not the choice for capital, then

the town will not materially suffer and would still continue to grow and increase in importance, albeit more slowly.

One aspect of Northern development in which Hay River is less likely to share is the development of the tourist industry. The town is definitely not an attractive tourist location, and the combination, during the tourist season, of dust, insects and mud make it unpleasant when compared with Yellowknife. Moreover few facilities are at present offered and using the town as a take-off place to reach fishing camps is at present the major tourist activity. The summer of 1966 will see increased development taking place in the provision of fishing camps in the Wrigley Harbour area. However, the whole area, the low, swampy shore of the southern Great Slave Lake lacks the interest and rugged beauty of the Shield areas and the East Arm. Even the local attractions of Alexandra and Kakisa Falls are some distance from Hay River, and are essentially on the road to Yellowknife.

As a town Hay River is poorly developed by normal Canadian standards. It has a low standard of housing far below the norm for Canada. It also has a poor standard of building generally. The level of income is particularly low and the number of metis and marginal whites is quite high. Many seem reluctant to accept a higher standard of living, which could in fact prove to be too expensive for them. The labour force is largely unskilled and extremely mobile which frequently detracts from the stability of small enterprises. For skilled labour the town is still largely dependent on the "outside."

However, this situation is gradually improving and the town is

becoming more like the average small town in the "outside." Today its poorly developed nature is less apparent than it was in the early 1950's; although with recent rapidity of change it is more of a problem. There is a general decrease in the proportion of males in the population, and a rise in the number of married people, and families, although the population is still essentially a young one. The prime labour force seems more similar to that of Canada than that of the Northwest Territories. Modern Hay River has always had relatively good connections with areas of continuous settlement in Canada. In fact it is true to say that in the totality of urban development, morphology and problems, there is a greater degree of similarity between Hay River and towns in Northern Alberta, such as High Level, Waterways and Manning, than between Hay River and Yellowknife, or a more extreme case, Inuvik. Thus in this, as in many other cases, political boundaries divide, rather than unite areas of similarity.

One of the greatest improvements has been the designing of a new planned subdivision, which will do much to offset the problems posed by the sprawling, unplanned Hay River located on Vale Island. Its impact will be even greater, when a master plan for the whole community is produced. This in turn would be of much greater value if it could be combined into a regional plan for the whole Great Slave Lake area, or indeed a regional plan for the Mackenzie Area. This planned subdivision, providing an answer to the annual flooding problem of Vale Island and consequent risk to life and investment, may well be in line with the development of the community. It seems unlikely that the fishing village will move from the West Channel, and it is possible that the

present Vale Island site could become a summer outpost, where facilities were opened up each season. As an urban centre the town can perform its function much better and provide better services if it is located in a pleasant well-planned site. However, although the plan incorporates sound principles, it does embody elements of southern planning ideas which may not be so effective in the North; in particular the provision of single family dwelling each on its own lot, giving a low population density in an area of harsh winter conditions and which is costly to service. It is interesting to note that whilst human inertia was as important as physical factors in the location of present Hay River, these latter (climate, surficial material, permafrost and flooding) become more and more significant as Hay River grows and as there is a need for more houses, larger and better buildings, runways and dock and shipyard facilities.

Thus southern influences on the Hay River delta have produced a modern subarctic community, perhaps a series of communities. But in its early days the influences were far from good; the town developed under limited, speculative, boom conditions in a disorganized unplanned fashion in a very poor site. The diversity of private interest and enterprise means that different views are held as to what path, or paths, future development of the town should take. The wide economic base of the town means that overall control by the government, whether Federal or Territorial is not easy. Thus overall planning or schemes to fit Hay River into any kind of outline of Northern Development will be difficult, will meet with considerable opposition and encounter formidable problems. The very solution of the latter will more than likely lead to yet

more problems. The town of Hay River is however one of the most advanced and well-developed in the North and provides many pointers for future urban growth in the Canadian North as a whole.

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APPENDICES

APPENDIX I

COMPARATIVE CLIMATIC DATA

	Hay River	Fort Smith	Fort Vermilion	Fort Resolution	Churchill
Annual precipitation in inches	12.59	13.28	13.92	11.55	14.25
Annual rainfall in inches	7.26	7.76	8.83	6.56	9.73
Monthly average temperature °F					
January	-12.2	-13.8	-9.5	-14.9	-16.3
March	3.8	6.1	11.7	1.9	-4.3
May	40.8	45.6	49.7	42.0	30.2
July	59.8	61.1	61.7	60.2	54.7
September	46.8	46.2	47.4	45.7	43.0
November	11.2	11.0	12.5	12.4	6.4
Days below 65°F	14,518	14,176	13,113	14,796	16,728
Day Degrees above 42°F	1,466	1,562	1,942	1,456	769
Frost Free Period in days	88	59	65	92	63
Mean date last Spring frost	June 11	June 18	June 13	June 10	June 28
Mean date first Fall frost	Sept 7	Aug 16	Aug 17	Sept 10	Aug 30
Precipitation May-Aug in inches	4.99	5.69	7.07	4.44	7.31

Source: Publications of Dept. of Transport, Meteorological Branch. Frost data is for the years up to 1950.

1. Δ

1. $\frac{1}{2} \leq \frac{1}{2} \leq \frac{1}{2}$ 2. $\frac{1}{2} \leq \frac{1}{2} \leq \frac{1}{2}$ 3. $\frac{1}{2} \leq \frac{1}{2} \leq \frac{1}{2}$

Phragmites

APPENDIX II

NAVIGATION SEASON ON THE MACKENZIE WATERWAY

	Opening of Navigation			Closing of Navigation		
	Earliest	Latest	Average	Earliest	Latest	Average
Waterways	Apr. 20	May 5	May 1	Oct. 8	Nov. 5	Oct. 15
Chipewyan	May 5	June 1	May 12	Oct. 4	Nov. 2	Oct. 13
Fort Smith	May 7	June 3	May 13	Oct. 5	Nov. 20	Oct. 20
Fort Resolution	May 6	June 1	May 15	Sept. 20	Oct. 10	Oct. 6
Yellowknife	June 1	July 12	June 15	Sept. 20	Oct. 10	Oct. 6
Hay River	June 5	July 6	June 10	Sept. 15	Oct. 10	Oct. 5
Fort Providence	May 6	May 15	May 10	Oct. 1	Oct. 20	Oct. 10
Fort Simpson	May 4	May 20	May 14	Sept. 20	Oct. 31	Sept. 30
Fort Nelson	Apr. 20	May 1	Apr. 26	Oct. 4	Nov. 2	Oct. 15
Fort Norman	May 10	May 20	May 15	Sept. 15	Oct. 15	Sept. 30
Fort Franklin	May 15	June 30	June 1	Oct. 1	Oct. 20	Oct. 12
Great Bear Lake	July 15	Aug. 12	Aug. 1	Sept. 15	Nov. 2	Sept. 22
Fort Good Hope	May 20	June 10	May 30	Sept. 15	Oct. 15	Sept. 20
Aklavik	June 6	July 15	July 10	Sept. 10	Oct. 15	Sept. 15
Tuktoyaktuk	July 20	Aug. 15	Aug. 1	Sept. 1	Sept. 15	Sept. 4

Source: T. Lloyd, 1943. The dates are those when reasonably safe commercial navigation may take place or cease.

APPENDIX III

FLOOR SPACE BY INDUSTRIAL DIVISION,
HAY RIVER, 1964

Industry	Total Floor in sq. ft.	Sq. ft. of Floor Space per 100 Residents	Valuation in Dollars	Dollars per 100 Residents
Fishing	61,475	3,073	173,930	8,696
Construction	9,309	465	18,810	940
Manufacturing	--	--	--	--
Transport and Communication	60,735	3,245	686,417*	39,224
Wholesale	6,384	319	224,980	11,249
Retail	76,045	3,802	135,998	6,799
Finance, Insurance and Real Estate	1,927	96	4,300	215
Service	130,069	6,540	701,374	34,500
(Community)	33,799	(1,689)	(481,410)	(24,070)
(Personal)	65,058	(3,252)	(136,100)	(6,805)
(Government)	25,466	(1,273)	(64,214)	(3,260)
(Recreation)	5,746	(287)	(12,650)	(632)
TOTALS	345,952	17,403	1,938,809	96,944

Source: Based on tax and assessment files, Hay River M. D. for 1964,

*75 per cent of this is C. N. T.

APPENDIX IV

AGRICULTURE

The potential for cultivation in parts of the Northwest Territories has often been commented upon, and there are an estimated four million acres of land that could be productive. Much of this lies in the southern part of the Territories in the sandy and alluvial loams of river flats. In the Hay River Valley some ten acres are under commercial cultivation at present. There are two gardens just east of the Mackenzie Highway at Mile 20, and one at Mile 18.

The crops that have been grown in the Hay River area, potatoes and a wide variety of vegetables have been indicated in Chapter III. Leahey considers that under the prevailing climatic conditions certain grain and hay crops could also be grown.* Much of the river flat area along the Hay River could be brought under production with fertilization and drainage. The major climatic problems are, insufficient moisture and a cool climate during the vegetative period, despite long day length at this latitude. Although the climate may be warmer in summer and milder in winter away from the lake it appears that this area may suffer from frost when the town of Hay River does not. Thus on 25th July 1965 a frost occurred (the first in July for fourteen years) and damaged some of the crops.

The existing gardens are on brown silty loam and are sheltered by tree growth. Production of potatoes, beets and cabbage seems to be

*A. Leahey, Preliminary Soil Survey of Lands Adjacent to the Mackenzie Highway in the Northwest Territories, Experimental Farms Service, Canada Dept. of Agriculture, Ottawa 1953, p. 10.

excellent; a wide variety of vegetables--peas, beans, celery, lettuce and cucumber are also grown; fruits such as strawberries also do well. There is a ready local market for such produce in Hay River itself, Pine Point and Meander River.

Between 1962 and 1965 a dairy farm was established at Mile 18. This enterprise has thirty-six head of Brown Swiss cattle which do quite well, despite the unusual environment. Feed has been brought in from Fort Vermillion although it can be grown locally. However the operation was considered unhealthy in 1965 by local medical authorities and milk production curtailed. Thus whilst there is a considerable demand for such milk in the area it seems that the cost of installing proper facilities in such a small isolated operation will prohibit further production.

In summary the following recent statement is quoted:

As long as there is no scarcity of good agricultural land in Southern Canada, there are no economic reasons for the development of commercial-scale agriculture in the North. This field of activity will not provide a base for economic growth in the near future. However, the kitchen garden, and under certain circumstances, the small market garden have a place in the North and will continue to provide monetary, nutritional and psychological benefits to northern residents.**

With the development of cheap and easy transportation in this area it seems that expanded agriculture is unlikely.

**Canada, Northern Affairs and National Resources, N. W. T. Today, a reference paper for the Advisory Committee on the Development of Government in the Northwest Territories, Ottawa, 1965, p. 26.

APPENDIX V

BUSINESS SURVEY QUESTIONNAIRE

Type of Business:

Date:

Employment

1. Total Employment _____

2. No. employed in each of the following:

	<u>Male</u>	<u>Female</u>
a) Managerial	_____	_____
b) Skilled	_____	_____
c) Unskilled	_____	_____
d) Full time	_____	_____
e) Part time	_____	_____

3. Is any of your labour seasonal? Yes _____ No _____

If so, what time of year? _____

4. What number of your employees have been with the firm

less than 1 year _____	5 - 10 years _____
1 - 3 years _____	10 - 15 years _____
3 - 5 years _____	more than 15 years _____

5. What are your man/hour totals worked/week _____

6. What number of your employees live in Hay River? _____

7. What is your peak employment? _____

8. What is your minimum employment? _____

Financial

1. Does your firm pay a) Weekly _____ b) Semi-monthly _____
 c) Monthly _____

2. On the basis of (1) what is your total payroll? _____

3. The number in the following brackets:
- | | |
|---------------------------|-----------------------------|
| a) less than \$2000 _____ | d) \$6000 - \$8000 _____ |
| b) \$2000 - \$4000 _____ | e) \$8000 - \$10,000 _____ |
| c) \$4000 - \$6000 _____ | f) more than \$10,000 _____ |
4. Amount spent on raw materials and supplies _____
5. What amount is spent in Hay River?
- | |
|----------------------------|
| a) retailers _____ |
| b) wholesalers _____ |
| c) personal services _____ |
| d) service industry _____ |
6. Amount spent outside Hay River:
- | |
|--|
| a) in Edmonton _____ |
| b) elsewhere - please specify place(s) _____ |
| _____ |
7. What is the approximate gross income? _____
If classified, what range are you in? _____
8. What is cost of utilities? _____
9. What is your fixed cost? _____
10. What are the slack periods? _____
11. Do you market entirely through non-local sources? _____
Where, and to whom? _____
12. If no to (11) how much is sold in
- | |
|--|
| (a) Hay River _____ |
| (b) Great Slave Lake area (please specify) _____ |
13. Are your premises rented _____ owned _____
If rented, what is the cost? _____
Does the renter live in Hay River? _____

Sales

1. Where is the head office of this business?
 - (a) Hay River _____
 - (b) Edmonton _____
 - (c) Elsewhere (please specify) _____
2. What percentage of your sales are outside Hay River? _____
3. What are the main markets? _____
4. (Retail) Do you do business with visitors? _____ If so, what are gross sales to visitors? _____
5. What proportion of sales/business is done with:

(a) Government _____	(e) Transportation outfits _____
(b) Construction _____	(f) Wholesalers _____
(c) Fishing Cos. _____	(g) Retailers _____
(d) Exploration parties _____	(h) Others (please specify) _____
6. What amount is taken in by firm's year/sales? _____
7. What is the value of permanent inventory? _____

General

1. How long have you operated in Hay River? _____
2. Has your business/firm expanded suddenly at any time, please give details.

3. Did you move to Hay River from elsewhere? _____ Or is this a Hay River development?

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